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Rubber in the Movies

Some of the Specific Technical and General Problems of the Motion Picture Industry Solved with Rubber

By L. L. Horchitz

Manager, Mechanical Sales, B. F. Goodrich Co., Los Angeles, Calif.

MECHANICAL rubber goods salesmen are often called in for advice and opinions pertaining to the solution of difficult problems. The motion picture industry in particular is often confronted with problems of a startling nature. Not always are these problems amenable to handling by even so flexible and elastic a material as rubber, but based on past experiences the studios have come to regard rubber as the Alpha and Omega of all construction materials. Rubber was first used in the studios to emulate nature in the guise of foliage and the like, as well as for knives, stilettos, pistols, statuary, and other props, but its use now runs the complete gauntlet of the motion picture industry—from studios to projection screens. Rubber has definitely arrived in this industry!

It has been our interesting experience at Goodrich during the past several years to be called upon at various times to help with some of the problems of motion picture producers which constantly crop up. For instance, Goodrich participated in the development of process motion picture photography, a process which is now practically perfect. Process photography itself is one of those inventions mothered by necessity and fathered by financial committees which frowned upon the large expenditures involved in moving both high-salaried casts and high-priced equipment great distances in order to secure the proper background essential to the script.

An example of process photography is in order. Several years ago a picture called "They Had to See Paris," starring the inimitable Will Rogers, appeared. Familiar scenes of Paris, such as the Champs Elysees, Bois du Boulogne and l'Arc de Triomphe appeared in the picture, while the accustomed Parisian street noises, raucous French taxi horns and street hawkers' voices in French were heard. When viewing the picture many of us licked our chops in envy at what seemed to be a happy assignment for any movie troupe —being sent all the way to Paris to take these delightful scenes. As a matter of fact the troupe never left Burbank, California.

What actually occurred involved the use of process photography. The motion picture studio arranged for its foreign correspondents to take certain scenes of typical Parisian backgrounds and also sound recordings of typical street noises. Both scenes and recordings were sent to the Burbank studio. At the studio, the scenes were projected by a reversal process upon a translucent screen. The cast performed behind this

The bayonet used in the above scene, showing Douglas Fairbanks, Jr., in "Gunga Din," is made of rubber.

translucent screen within range of a recording camera and sound equipment located on this side of the screen. The recordings of Parisian street noises were fed in at appropriate spots.

The obvious result of the picture taken by the recording camera located behind the translucent screen was to show Will Rogers and other members of the cast walking about before the animated scene, while the composite result when projected on the screen in the theatre creates the illusion that the cast was actually in Paris, for the ocular proof is there before the movie-goer—all of the hustle and bustle of the busy streets.

Rubber in Process Photography

Where does rubber fit into this picture? The early process screen consisted of a piece of polished plate glass with a sand-blasted surface. Plate glass would seem to be a "natural" for the problem involved, but unfortunately the problem is far more complex than is immediately apparent. In the first place, plate glass is limited as to size obtainable. In the second, even if pieces as large as 18 feet square were obtainable, the necessary thickness of the glass would result in complex light refraction and reflection angles, to mention a few technical difficulties. In other words, large pieces of plate glass must be at least 3/8ths of an inch thick for safety purposes. Therefore, the amount of light projected on the surface requires a tremendous stepping-up in the electrical power of the projectors to force a sufficient amount of light through the screen so that the reversed scene or scenes will photograph well on the opposite side.

Technicians will appreciate the fact that in view of the fact that the light is projected through a lens, the varying angle of incidence leads outward from the actual center of the screen toward the edges. As this angle increases, the angle of reflection from the surface likewise increases and as this angle becomes greater the actual amount of light transmitted through the screen becomes so lessened that at the outer edges of the screen, particularly at the corners, a very distinct darkened area appears. The center, of course, represents the "hot spot" of light.

The motion picture industry wrestled with the problems raised by these hot spots and darkened areas for some time, until one of the studio technicians raised the question whether some form of rubber, similar to the type found in Anode-deposited rubber gloves, could not be used to advantage. He argued that since this rubber was only approximately .009-inch in thickness it would overcome the objection of the high angle of refraction in the thicker plate glass then being used which resulted in "fuzzy" images. This was found to be true. It was also discovered that the translucence of rubber sheet made by the Anode process was superior to that of glass, strange as it seems, this being due largely to the low reflective qualities of the rubber as compared with glass.

Restriction on Rubber Sheets

As a result of the experiments and practical tests undertaken in this direction, Goodrich went into the manufacture of fairly large size rubber sheets for use in process photography, but unfortunately we were faced with equipment limits which held down the size of the sheet. While a large portion of the process work involving nominally small areas, such as scenes taken through open windows or doorways, the backs of taxicabs, railroad cars, etc., were taken using rubber screens, the larger outdoor work was still confined to glass.

Although the development of a rubber sheet for use in process photography has been temporarily halted for other than small screens, this development paved the way for a solution of the larger sizes required of some material other than glass. Motion picture technicians finally discovered that a cellulose acetate screen, resembling a large piece of cellophane with an egg shell finish on one side, solved their filming difficulties. As a rule, the studios make these acetate screens on their own premises. Rubber, however, is not completely eliminated from this picture, since the screen is suspended tautly under tension by means of a special type of extra strong rubber band developed to resist the intense heat caused by projected light.

In addition to technical problems similar to that

All the food on the table in this scene from "Next Time I Marry," starring Lucille Ball, is of rubber.

described, rubber plays an important role in other branches of the film industry. We have all seen the villain grab a "bronze" statue from the newel post at the foot of a stairway and bend it around his poor victim's head. We probably cringed in sympathy with that cracked skull. But actually the victim received only a gentle massaging of his scalp by a hollow rubber statue, sometimes inflated with air and sometimes filled with ground sponge rubber, but in any case having a lead wire core which would serve to hold the statue in a bent position, thus giving the full illusion of realism.

In scenes where ferocious alligators pursue swift swimmers, the chances are that the "beast" moving so rapidly and snapping his jaws so viciously is in reality a man with a cleverly-designed rubber head or mask fitted over his head and shoulders, with only the mask seen in the picture. When a tropical hurricane whisks through the South Seas in a motion picture, the palm trees and other vegetation are probably no more real than is the force of the storm. Rubber forms the tree trunks and the foliage and an airplane propeller generally furnishes the breeze.

Call for Waterproof Hair

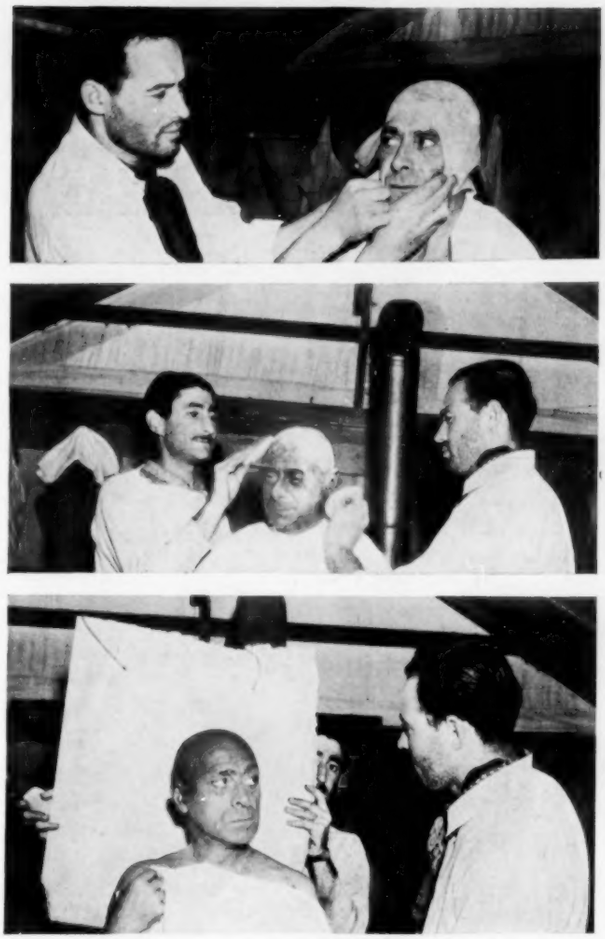
One particularly interesting assignment given to Goodrich by the motion picture industry some years back called for the provision of waterproof hair for a group of female swimmers. The movie script called for fifty young ladies having equivalent height, weight and shapeliness, with each to be equally accomplished in the arts of fancy diving and swimming so that they could perform in ranks and squadrons in the water, thus forming groups and patterns so dear to the heart of Hollywood producers.

That part of the assignment was difficult enough for the studio casting department, but the director threw in another requirement: These girls were to have long flowing tresses which could be twined about their bodies in such manner as to create the illusion that their own natural braids comprised their only clothing while they performed in the water. To find long-haired beauties in this day and age was given up as impossible, so the make-up department was called upon to furnish wigs. But another problem immediately presented itself.

Rubber Solves the Problem

As is well known, rarely is the first "take" of a motion picture scene suitable for use in the finished film. Frequent re-takes are often necessary to achieve the desired result. In the interest of economy, these re-takes must generally be made as soon as possible. In the instance under discussion, this happened: Once the girls entered the water the wigs were wetted and immediately lost their artistic curl and loveliness, so that the swimming beauties looked more like drowned cats. The filming of the actual aquatic scene was only a matter of a few minutes, but re-takes could not be made until all of the beautiful wigs had been entirely dried and recurled and reset on the girls' heads. Something had to be done to shorten the time interval between re-takes, each lengthy interval costing the producer a pretty penny.

Rubber again supplied the answer. Sculptured models of the wigs were developed in plaster of Paris and, working with these as a base, latex-deposited caps were made in upwards of fourteen sections which were cemented into continuous strips after completion. When photographed, these strips gave the impression of natural hair wound gracefully around the heads and twined around the bodies of the swimmers. The original takes and re-takes went off in regular order with a minimum of delay and shortened the production time of the spectacle.



Making up Eduardo Ciannelli for his role in "Gunga Din." Top, a latex cap is sprinkled with water and stretched over the head; center, the fitted cap is powdered; bottom, the finished effect. All photos by RKO Radio Pictures.

Goodrich has often been called upon to supplement the physical deficiencies of actors or actresses or to create abnormalities or deformities so that the stars could perform in character before the camera. In one instance, a rubber glove was developed to disguise the mutilated finger of a prominent comedian. The glove gave the effect of a natural whole hand, and permitted the comedian to perform in assignments which he could not otherwise have accomplished.

In another instance, the script called for a scene duplicating those in existence during the Elizabethan Period. The costuming of that period called for rather voluminous dresses with extreme low cuts at the throat, exposing a generous expanse of bosom. The star of the story was extremely low-chested, and an artificial high bosom had to be created. A plaster cast of the young lady was first made by virtually dipping her into a trough of wet plaster of Paris. The studio sculptor then modeled in plaster the contours fitting the gown. Using these two casts as separate forms, latex deposits were made on each, and the individual pieces were then cemented together and vulcanized. The intervening space was then filled with a fluid, largely composed of glycerine, to give the necessary bulk. When applied to the wearer and fastened to

her person by means of spirit gum, the effect was amazingly life-like.

Due compliment must be paid to the movie studio cosmeticians for the ingenious manner in which they apply and blend in the natural color of rubber with the flesh of the performer so that no evidence is visible to the camera as to where nature leaves off and art begins. Of course, the problems mentioned are only a few of the many which might be cited, but they are sufficient to indicate how rubber is helping the progress of the motion picture industry, and serve the purpose of acting as examples and inspiration to the rubber industry for still further accomplishments in the realm of make-believe.

Brandwood Patent Tire Cord

SEVERAL strong claims of superiority over all existing types of tire cord are made for the Brandwood Patent Tire Cord, a development of John Brandwood (of England), which is being manufactured by the Elton Cop Dyeing Co., Ltd., Bury, Lancashire, England. Chief of these claims are that the strength of the new cord is 100% greater than that of tire cord of similar gauge made by the ordinary processes, whether from cotton or rayon; that it can be made practically stretchless, one type with a gauge of .036-inch having a tensile strength of 50 pounds, with an elongation of 10% at break; and that it will revolutionize the entire art of the production of the strongest cords and fabrics for motor tires, belting, thread, etc.

The Brandwood Patent Tire Cord, according to its inventor, does not depend on the usual spinning, doubling and cabling operations to apply sufficient twisting of the fibres to give the necessary tensile strength, but depends on strengthening each individual fibre, making fibre to fibre slippage impossible and increasing the density of the cord. It does not depend on coating the threads with rubber or other materials, Mr. Brandwood states, but the cord "amalgamates" with the rubber so that slippage of the cord apart from the rubber of the tire is impossible, no matter how great the shocks or overload that may be placed on the tire.

Woodflour in Rubber Flooring

A SUITABLE formula for using woodflour as a filler in the manufacture of light-weight rubber flooring has been worked out by W. S. Dahl, 22 Stanley Road, London, S.W. 14, England, in conjunction with the Rubber Research Department of Imperial Chemical Industries, Ltd. Several patterns of light, dark and mottled colors have been successfully made with this formula, which follows:

Crepe Rubber	100	Woodflour*	160
China Clay	30	Whiting	50
Lithopone	30	Zinc Oxide	10
Paraffin Wax	2	Stearic Acid	2
Sulfur	2.5	Vulcatex Blue (B.S.)	4
Nonox N.S.	1	Vulcafor F	1

Cure: 20 to 30 minutes at 141° C.

*White Softwood Fir, 200 mesh

Experiments indicate that the white softwood fir of 200 mesh, which is fibrous and very white, is suitable for use in rubber flooring, according to Mr. Dahl, and it is sufficiently fine to obviate the need for dyeing before use. Furthermore, it is not necessary to use fugitive colors. The woodflour does not cause darkening during vulcanization at 141° C., and higher temperatures might be used with safety.

KOH Number Test

ONE of the papers delivered at the Rubber Technology Conference held in London, England, last May, which is included in the *Proceedings of the Rubber Technology Conference,* was devoted to an explanation of the KOH number test and its application to the compounding of zinc oxide in rubber latex. Because of the importance of this method to manufacturers using latex, we have asked the author of the original paper, H. F. Jordan, of the General Laboratories, U. S. Rubber Co., Passaic, N. J., to prepare a special abstract for us, which follows herewith:

The KOH number of latex is defined as the number of grams of KOH per 100 grams of rubber corresponding to the end-point (at pH 10.7-11) in the electrometric titration of latex with KOH. The KOH numbers of commercially available normal latices have been found to vary between 1.2 and 2.4, and those of creamed or centrifuged latices between 0.55 and 0.95. The KOH number of a normal latex may be reduced more than tenfold by creaming three times from 33% T.S. to 62% T.S.

Amount Varies with the Latex

The KOH number has been found to be an important control in compounding latex with zinc oxide. The amount of KOH for optimum stabilization (*i.e.*, maximum stability, minimum viscosity, and minimum change of properties with time) of zinc oxide compounds containing no other added buffering ingredient varies with the latex, and is numerically equal to the KOH number. This quantity of KOH produces a pH of 10.7-11.0. If appreciable amounts of protective ingredients such as casein, glue or gum arabic are added in compounding, sufficient additional KOH must be added to maintain a pH of 10.7-11 in the latex compound. The amounts of KOH required may be determined by electrometric titration of the protective ingredients.

Optimum stabilization in zinc oxide compounds containing "Captax" is obtained at pH 10.5, when the amount of KOH added is equal to the KOH number of the latex plus two-thirds of the amount stoichiometrically equivalent to the "Captax." Similar allowances for the alkali combining power of other acidic or hydrolysable accelerators or compounding ingredients must be made. The stability of zinc oxide compounds at a given pH is increased if the ammonia content is reduced. The optimum ammonia content has been found to be between 0.12 and 0.22% of the water content.

Stability in Latex Compounds

The observed empirical facts regarding the stabilization of zinc oxide compounds have been explained by the effect of pH and concentration of divalent positive ion on the cataphoretic mobility of latex particles. From measurements in potassium and calcium buffers respectively, it has been calculated that in order to obtain high stability in latex compounds, the concentration of divalent positive ions must be of the order of 0.002 M or less. In solutions of constant zinc and total ammonia concentrations the cataphoretic mobility is very low below pH 9.0, increases rapidly between pH 9.2 and pH 10.0, and appears to attain a constant value between pH 10.7 and pH 11.0. This is attributed to conversion of divalent zinc ammonia ion ($Zn(NH_3)_4^{++}$) into monovalent zinc ammonia hydroxide ion ($Zn(NH_3)_3OH^+$).

Use of Rubber and Allied Materials for Impregnating Glass Filter Cloths

Data on Procedure to Be Followed When Preparing Glass Filter Cloths for Use with Vultex, Neoprene, Thiokol or Korolac

BECAUSE of the different physical properties of glass filter cloth as compared with other media, it is necessary to observe certain precautions in order to capitalize on the inherent advantages of this new material. The importance of adhering to the following recommendations will be appreciated when it is borne in mind that glass cloth loses some strength when wet and that it is not so resistant against compression, abrasion, and flexing as cloths made from organic fibres.

Size of Cloth Required

Glass cloth does not shrink or stretch so that it is possible to economize by using narrower cloth than is customary with wool or cotton. Standard widths of Owens-Corning filter cloths are thus approximately one inch less than the widths ordinarily specified for other media.

The minimum length of cloth required for each double cover can best be determined by actual trial. Usually it will be found satisfactory to allow the cloth to extend from ½ inch to 1 inch below the bottom of the plate on each side in order to facilitate correct placement of the cloth on the plate.

It is necessary to impregnate glass cloth for plate and frame use for the following reasons: (1)—To prevent crushing of the fibres by compression between the bearing surfaces; (2)—To prevent leakage along the edge of the cloth; (3)—To reinforce the cloth against flexing at the inner edges of the bearing surfaces; (4)—To protect the cloth against the jet action of wash water and filtrate; (5)—To prevent unravelling of the cloth and facilitate cutting of holes; and (6)—To arrest failure at damaged spots on the cloth.

Area to Be Impregnated

The portions of the cloth to be impregnated for use in any type of press will be indicated by a careful study of the reasons for impregnating given above. Following is an outline of general principles to be borne in mind in deciding upon what areas to impregnate:

1.—Cloth must be thoroughly impregnated between all bearing surfaces to prevent crushing, leakage, and to facilitate cutting of holes.

2.—Cloth should be impregnated over all drainage grooves, and wash holes and drainage holes.

3.—Impregnation should be carried inwards beyond the bearing surface (and beyond drainage grooves and holes) by about ⅜ inch in order to reinforce the cloth against flexing. This is especially important where the plate is recessed.

4.—Where delivery holes are inside the joint surface of the plate, and especially where clip nuts are used, the cloth should be impregnated to prevent failure from compression, unravelling, flexing, and the washing action of the liquid.

5.—Each time the press is opened the cloths should be inspected and all damaged spots painted with dilute impregnant to arrest failure.

Each type of plate should be studied to determine the best way to impregnate the cloth in order to obtain maximum service from it. A short period of experimentation will invariably lead to quick solution of this problem and enable a template to be prepared for future impregnating work. The shaded areas on the accompanying sketches indicate the portions requiring impregnation for the more common types of plate.

Impregnating Materials

The most satisfactory general purpose impregnating material investigated by Owens-Corning is Vultex (*1*). This material is easy to apply, has good aging properties, and is resistant to most chemicals. The technique of application, given below, applies to Vultex, but the same general principles hold for other impregnating materials, such as neoprene (*2*), Thiokol (*3*), and Korolac (*4*), which find application in special situations where latex is unsatisfactory.

Method of Applying Impregnant

(1)—Prepare a thin latex solution by adding water until, when tested on a small strip of the actual cloth to be impregnated, the solution penetrates completely through the cloth when applied on one side only. Only just sufficient water should be added to achieve proper penetration. With some cloths it may be necessary to dilute the solution so much to secure adequate penetration when applied by brush only, that it loses its protective properties. In such cases it will be necessary to use a thicker solution and roll it into the cloth after applying with the brush.

(2)—Cut sufficient length of cloth for a double cover and lightly mark areas to be impregnated from the template with a soft pencil.

(3)—Apply ample thinned solution rapidly with a brush, rolling if necessary to get penetration.

(4)—Turn the cloth over and apply solution on the reverse side of cloth so that the two applications will intermingle and be as one when dry.

(5)—Hang up and allow to dry for about 8 hours.

(6)—Dust and rub impregnated surfaces with bentonite, zinc stearate, talc, or other dusting agents to prevent sticking to plates and frames.

(7)—Cut holes and trim, using template to assure accuracy.

If it is found that the solution used is too thin to

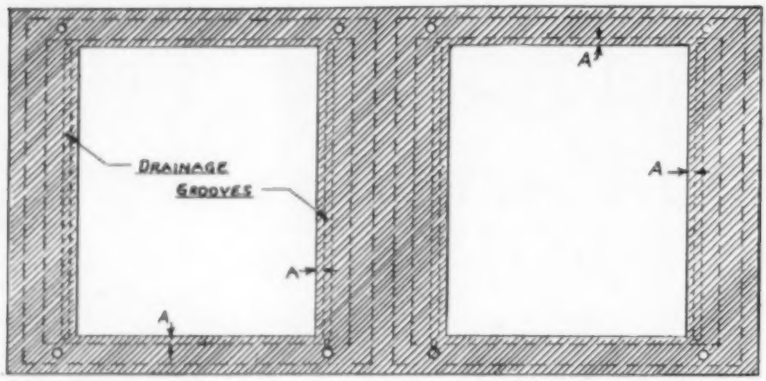
Note: This article is based on a Technical Bulletin prepared by the Owens-Corning Fiberglas Corp., Toledo, Ohio.

(1) Vultex is an ammoniacal aqueous suspension of vulcanized latex, made by the Vultex Chemical Co., Cambridge, Mass.

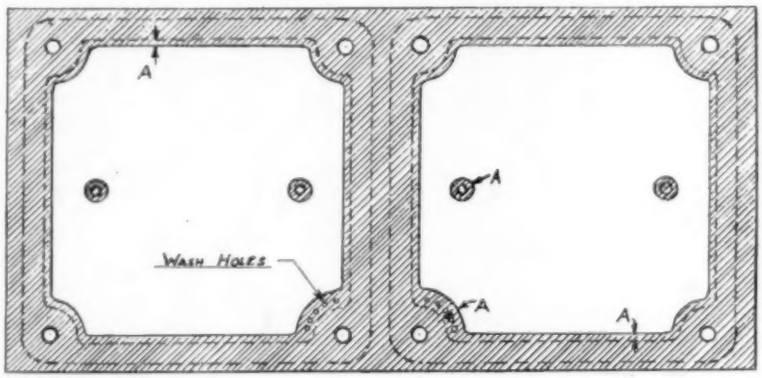
(2) Neoprene, in this case Latex Type 57, is the name given to its chloroprene rubber and latex by the Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Wilmington, Delaware.

(3) Thiokol is an olefin polysulphide made by the Thiokol Corporation, Trenton, N. J.

(4) Korolac is a solution of a modified vinyl halide polymer made by the B. F. Goodrich Co., Akron, Ohio.



LEFT: Sketch for impregnation of glass filter cloth or rubber grooved plate. Impregnation of cloth is extended 3/8-inch beyond inside edges of plate joints and drainage grooves. (Note "A" on diagram). Shaded portions indicate impregnated portion of cloth; broken edges indicate edges of bearing surfaces. Sketches taken from a technical bulletin.



RIGHT: Sketch for impregnation of glass filter cloth for flush type plate, corner feed and corner washing. Impregnation is extended 3/8-inch beyond inside edges of plate joints and all other points where cloth is exposed to pressure or jetting action. Shaded portion indicates impregnated portion of cloth; broken lines edges of bearing surfaces.

give good surface protection to the cloth, steps 3 and 4 should be repeated using full strength solution either before or after the first application of thinned solution has dried. This second application need only be made over those areas which will be in actual contact with the bearing surfaces. This also allows the impregnation to taper off towards the filtering area, giving better protection against flexing than if both applications were carried to the same point thus stiffening the cloth too much and concentrating flexure at this point. A study of the method of failure of any cover will invariably indicate the cause and suggest the remedy to prevent similar failures.

It is evident from the above remarks on impregnating that care must be exercised in fitting glass covers to insure that the impregnated areas are correctly placed. If for any reason the covers are removed, they should be put back on the same plates and in the same position as previously.

Operating Technique

In order to get best service from glass covers it is frequently necessary to make minor changes in the operating technique previously followed. These can best be determined by observation and test in any specific case. Following is a number of the more important variables which tests indicate should be modified when glass covers are used:

Cleaning:—Glass covers should be handled carefully, especially when wet. They should not be scraped, brushed hard, or knocked, nor should a high pressure jet be used for cleaning. Where possible an ordinary grade of wrapping paper or newsprint should be used over the glass cloth to facilitate removal of cake. (This also acts as a filter aid). If the cloth becomes blinded it can be cleaned by immersion in an acid solution.

Nature of liquor:—Owens-Corning Fiberglass filter cloths can be used to filter both acid and alkaline solutions. Best conditions for glass cloths as regards acidity or alkalinity of the liquor are not the same as for cotton, wool, or other organic textile materials. Optimum conditions in this respect are best determined by test if the process is susceptible of change.

Condition of equipment:—It is important to keep plates in good condition, removing sharp corners when they appear.

Operation:—The life of glass covers depends to a considerable extent upon the pressure used and upon the amount of flexing the cloth receives in service. Consequently, it is desirable to reduce pressures and the severity of the drying and washing cycle as much as practicable.

Design of Equipment

Test work on various designs of presses are not yet complete but results to date indicate that the following design features are of importance:

Type of backing:—A perforated plate or wire screen backing is preferable to grooved or pyramid plate designs. Of the latter types the grooved design is better than the common pyramid designs. A cotton or wool cloth backing also greatly prolongs the life of glass covers. Use of perforated plate, screen or cloth backing reduces the area it is necessary to impregnate and thus avoids loss of filter area and reduces the cost of glass covers.

Pumps:—A centrifugal type pump, or a dampening device which reduces the pressure fluctuations of a diaphragm or plunger type pump is desirable to reduce the movement of the cloth during the filtering operation.

Plates:—Recessed plates are undesirable because of the lack of stretch in glass cloth and the consequent strain put on it when forced into the plate. Rectangular plates and frames are most economical in cloth than circular or triangular. In general, corner or side feed designs are preferable to center feed types.

Charles Goodyear

CONNECTICUT YANKEE AND RUBBER PIONEER

By P. W. Barker

CHAPTER XI

World's Fair at London — 1851

BEFORE entering the courtroom as one of the principals in The Great India Rubber Case—Goodyear *vs.* Day—Charles Goodyear was to have his day of triumph at the first general world's fair, held in London in 1851. It was called "The Exhibition of the Works of All Nations." Held in Hyde Park, it was housed in the "Crystal Palace," an immense building of glass and steel especially constructed for the occasion. The building itself was curiosity enough to attract millions.

Goodyear's Vulcanite Court

The London exhibition gave Goodyear an excellent public forum to show the world at large and Englishmen in particular that his art of rubber manufacturing had surpassed that of all his rivals. The inventor's health at this time was extremely poor, and he was compelled to walk with crutches. The legal battles with Day sapped his vitality, taking a considerable amount of time and strength, as well as money. Nevertheless, he wholeheartedly entered into the preparation of an exhibit for the Fair which he appropriately termed Goodyear's Vulcanite Court.

A prominent position, the nave of the main hall, was alloted the Vulcanite Court to the complete annoyance of the British Press. About $30,000 was expended on the display which consisted of a suite of covered rooms in which every article was made of rubber—walls, roof, cornices, carpets and even furniture. Chairs, bureaus, desks and shawl cases were of rubber or of wood with beautiful hard rubber veneers. Hard rubber combs and hard rubber buttons made their world debut in the Court. Musical instruments, canes and knife handles were among other hard rubber objects on display. Over this panorama of rubber floated rubber balloons (some as much as six feet in diameter), painted and printed in multi-color, several shaped and printed as worlds or globes inflated with hydrogen. Sightseers came in droves to witness this amazing exhibit.

Goodyear's chief English rival, Thomas Hancock, also exhibited at the Fair, entry being in the name of Charles Macintosh & Company. The Hancock display consisted primarily of coats, tarpaulins and solid tires for carriages. Both Goodyear and Hancock were especially proud of their rubber boats or rafts equipped with inflated pontoons.

Horace Greeley, founder and famous editor of the *New York Tribune,* attended the London exhibition as a juror, and wrote a series of articles on it as well as of his travels throughout Europe. But not a word appeared in his reports on Goodyear's Vulcanite Court. British newspapers generally criticized the exhibits from the United States, terming them "crude" and accusing them of lacking "fineness." We were yet considered a people living in the wilderness. Such criticism made Greeley irate, and he struck about him fiercely with his vitriolic pen in defense of his native land and its manufacturers. It is all the more strange, then, that Greeley ignored the Vulcanite Court and did not cite it as one of the outstanding American exhibits.

The only possible explanation of the *New York Tribune* editor's silence on Goodyear—a journalistic blot if true—is that Horace H. Day was a leading advertiser of the *Tribune,* whereas Goodyear was not. Day also exhibited at the Exposition, but received no award nor even honorable mention. Greeley did take cognizance of rubber articles on display, since he wrote, "India Rubber is abundant here, but I have seen no Gutta Percha, and our New York Company (Hudson Manufacturing) might have put a new wrinkle on John Bull's forehead by sending over an assorted case of their fabrics."

Other American Successes

McCormick's reaper scored a notable victory at the Fair as did a Mr. Hobbs who opened British-made locks as though they were unbolted doors. Greeley made mention of these American successes in his copious notes. His general reaction to the first world's fair, however, given in answer to the suggestion that the Congress of the United States should have made an adequate appropriation for a national exhibit at the Exhibition, was expressed thus, "I do not see how any tangible and adequate benefit to the Nation would have

NOTE: This biography of Goodyear started in our April, 1938, issue.

Front and back views (left and right, respectively) of the Council Medal awarded to Charles Goodyear for his "Manufactures from Caoutchouc" at the first world's fair, held in London in 1851. The medal was of bronze and the reproduction is reduced approximately one-third.

resulted from such a dubious disposition of National Funds."

When the prizes were awarded for rubber displays, called "Manufactures from Caoutchouc" in the official catalog, Goodyear and Hancock (or Charles Macintosh & Company) each received the highest honor possible —Council Medals. Only 170 such medals were distributed at the Exhibition, and only three went to Americans.

Jury Approves Goodyear's Products

In giving the award to Goodyear, the jury indicated the pleasure of its members of his waterproof garments, as well as of his air mattresses and cushions. All of these articles were manufactured to sell at popular prices within the range of the average consumer and not for the luxury class alone as was the case in Europe. The inventor's rubber parchment, prepared by compressing layers of fiber and covering with a thin film of rubber, struck the jury's fancy in particular. This material was recommended as a wall covering, for the production of large wall maps, and for the sails of vessels. Goodyear's shoes and rubber boats with inflated pontoons received favorable passing marks.

The jury also commended the discoverer of vulcanization for his recognition of youth, for Goodyear had prepared rubber heads for dolls and displayed a number of rubber playthings in the form of animals and the like. His hard rubber veneered furniture did not escape the jury's attention, which recommended the new material for the manufacture of buttons and handles for penknives and table knives. All in all, the jury was very well pleased with Goodyear's Vulcanite Court.

Second Class awards made at the London Exhibition, consisting of Prize Medals, went to the Hayward Rubber Company, which was manufacturing as many as 3,000 pairs of rubber boots and shoes daily at the time under Goodyear license; to S. C. Moulton, of England, manufacturing waterproof fabrics, shoes and saddlery, under Goodyear license; and to five other British and French rubber manufacturers. Out of five Honorable Mention awards, one was to Church & Chrittenden, American manufacturers, for low-priced rubber shoes made under Goodyear license. It will be noted that Goodyear and his licensees fared quite well at the first world's exhibition.

Excerpts from Jury's Statement

The question of who discovered vulcanization is commented on in a preliminary statement contained in *Reports by the Juries at the London Exhibition*, published in 1852 by William Clowes & Sons, London. Although the statement itself is too long for quotation, excerpts are of interest, to wit:

"Since 1842 Charles Goodyear imported into Europe shoes which possess an unlimited and permanent elas-

Front view of Goodyear's Vulcanite Court at the London Fair in 1851, taken from a sketch appearing in Peirce's "Trials of an Inventor—Life and Discoveries of Charles Goodyear," published in 1866.

ticity, and which resist cold; two of their surfaces may be pressed against each other without the least adhesion taking place. These are precisely the remarkable qualities which characterize that caoutchouc which is called in the present day vulcanized India-rubber.

"Impressed, perhaps, with the idea, too often moreover a just one, that the specification of the patent is sometimes nothing more than the occasion of attracting the attention of imitators, Mr. Goodyear took no patent on this article, but he endeavored in Europe to take advantage of his discovery, by communicating it as a process of which he alone possessed the secret, which might be lost to mankind and disappear with its sole possessor, when Mr. Thomas Hancock, of Stoke Newington, who had been engaged in Europe in working caoutchouc with no less perseverance and success than Mr. Goodyear in America, discovered anew the process of the vulcanization of India-rubber, and secured it by a patent, which Mr. Goodyear afterwards demanded for the same subject.

"Mr. Thomas Hancock discovered that a band of caoutchouc dipped into sulfur, and impregnated with this substance, without losing any of its properties, only required to be afterwards exposed to a temperature of 300° Fahrenheit, to acquire properties entirely novel, which were precisely those possessed by the material employed by Mr. Goodyear for the waterproof shoes.

"This was, as may be seen, a new discovery of a fact already known—a novel solution of a problem which was known to be soluble, since it had been already solved."

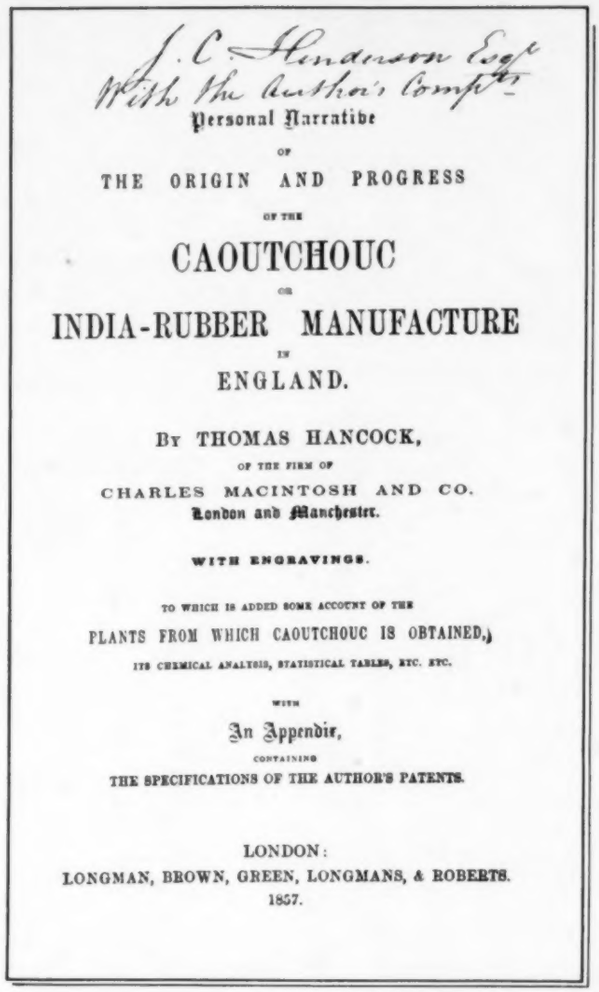
Goodyear Discarded Sulfur Process

Charles Goodyear was familiar with the treatment of rubber by immersion in molten sulfur, the variation of the process of vulcanization on which rests the claim of Thomas Hancock; but he had discarded this process for the one described in his vulcanization patent, U. S. P. No. 3633 of June 15, 1844. Two witnesses under oath testified in The Great India Rubber Case, at Trenton, New Jersey, in 1852, that Goodyear had tried the less satisfactory method in 1839 and 1840.

A careful reading of Hancock's British patent, sealed November 21, 1843, and enrolled May 21, 1844, will reveal the fact that the inventor considered the use of "silicate of magnesia" and "asphalte" equal to or more important than the use of sulfur and heat in rubber manufacture. And again, in his autobiography, *Personal Narrative, Etc.*, of 1857, Hancock frankly tells of receiving from Paris in 1840 a piece of rubber which had been treated with sulfur (p. 89), and in the autumn of 1842 (p. 91), "Mr. Brockedon showed me some small bits of rubber that he told me had been brought by a person from America, who represented himself as the agent of the inventor."

Hancock Received Actual Samples

Brockedon gave Hancock two small samples of this rubber from America which had all the desirable merits for which rubber manufacturers had been striving, and Hancock remarks of these samples (p. 93), "The first named had a slight smell of sulfur, and I thought that a little sulfurous powder had been rubbed on to mislead. On stretching them out thin, I observed they were both quite opaque. I found they were, as stated, not affected by cold." This was sufficient clue to the method of manufacture for an investigator with the high degree of intelligence and



J. C. Hindmarsh Esqr
With the Author's Compts

Personal Narrative

OF

THE ORIGIN AND PROGRESS

OF THE

CAOUTCHOUC

OR

INDIA-RUBBER MANUFACTURE

IN

ENGLAND.

BY THOMAS HANCOCK,

OF THE FIRM OF

CHARLES MACINTOSH AND CO.

London and Manchester.

WITH ENGRAVINGS.

TO WHICH IS ADDED SOME ACCOUNT OF THE

PLANTS FROM WHICH CAOUTCHOUC IS OBTAINED,

ITS CHEMICAL ANALYSIS, STATISTICAL TABLES, ETC. ETC.

WITH

An Appendix,

CONTAINING

THE SPECIFICATIONS OF THE AUTHOR'S PATENTS.

LONDON:

LONGMAN, BROWN, GREEN, LONGMANS, & ROBERTS.

1857.

The title page from one of the few remaining copies of Hancock's "Personal Narrative," inscribed by the author.

long years of rubber experience of Thomas Hancock.

Too much time has elapsed since that memorable day in January, 1839, at Woburn, Massachusetts, when Charles Goodyear discovered the vulcanization of rubber by sulfur and heat, to disinter nationalistic arguments of over-zealous and ill-advised Americans and British. The words of the jury at London in 1852 were: "a novel solution of a problem which was known to be soluble, since it had been already solved."

(To Be Continued)

Transparent Rubber Gas Mask

A METHOD for making transparent rubber gas masks is the subject of a recent British patent (No. 481,627). The method covers forming the mask as a single seamless article by applying a solution of a suitable rubber derivative to a former of the required shape by dipping, spraying or brushing. A number of layers may be applied, and the former can be of glass, metal, wood, wax, or even rubber. Reinforcements of some textile material or wire gauze and fittings, such as screw nipples and fastenings, may be applied to the mask during or after the coating process, and with or without the use of adhesive.

Owners of Noble's "Latex in Industry" may secure a copy of an addenda and errata list, covering typographical errors and references added after publication, from THE RUBBER AGE, 250 West 57th St., New York.

"Mealorub" Rubber Powder

A Description of the Manufacture, Properties and Applications of a Newly-Developed Rubber Powder

A NEW type of rubber powder, which lends itself to new uses of rubber rather than to use in present rubber manufacturing processes, has been commercially developed by technicians of the Proefstation West Java, Buitenzorg, Java, Netherlands East Indies. The major portion of credit for the development of the process for the production of this new material, which is called "Mealorub," is given to J. W. van Dalfsen, chemical engineer at the Experiment Station.

Described as Real Rubber Powder

Mealorub is described as a real rubber powder, containing approximately 96% rubber, and possessing many remarkable properties. Its production consists of flocculating field latex with acid, removing the flocculate from the serum by centrifuging, and then washing and drying it. Although only a small pilot plant is now being used at the Station for the production of this powder, it is claimed that the chemical and physical properties can be guaranteed within very narrow limits in large scale production efforts due to the washing process in the centrifuge and to the easy manner in which different lots of the powder can be mixed.

To enable flocculation of the field latex in the production of Mealorub, a small amount of sulfur and zinc oxide is added. In the finished product, the greater part of the sulfur is found to be combined sulfur. This does not imply, however, that the sulfur is combined with the rubber hydrocarbon, since the average rubber analysis is not able to distinguish between sulfur combined with the rubber hydrocarbon and sulfur combined with non-rubber substances. The properties of Mealorub indicate clearly that the sulfur is not, at least for the greater part, combined with the rubber hydrocarbon as is the case in ordinary vulcanized rubber. The properties are somewhere between those of crude and vulcanized rubber, which would indicate that the sulfur is combined with non-rubber substances, for instance with the protein complex.

Due to its manufacturing process, Mealorub contains approximately the same amount of serum substances as crepe rubber, and therefore it cannot be classified as a whole-latex rubber as are most other rubber powders or crumb rubbers. It is the intention of the Experiment Station to send along an analysis report with each lot of powder exported. This analysis would show the following: moisture content, sulfur content, zinc oxide content, nitrogen content, ash (minus zinc oxide), acetone-extract (minus free sulfur), and water-extract.

In addition to normal Mealorub, a purified form will also be made available. In order to obtain low water-absorption properties, Purified Mealorub is prepared with a low protein and ash content. The water-absorption properties of vulcanized articles made from this purified rubber powder are said to be equivalent to those made from the best low-protein-content rubber available.

In physical structure, Mealorub consists of original latex particles, similar to ordinary crude rubber, which clot together during the manufacturing process. The special difference in properties between the new rubber powder and crude rubber is that in the former the forces holding the particles together are much smaller. During the process of producing Mealorub, every latex particle is coated with a thin non-adhesive layer. Due to this unique structure, disintegration of these particles becomes possible.

When Mealorub is wetted with a rubber solvent, swelling occurs. Unlike crude rubber, however, the swollen powder does not become sticky. The swelling tends to loosen the particles from each other so that mechanical disintegration is easily obtained. Dispersions with a very small particle size can be secured by the addition of larger quantities of solvent. By heating such a dispersion in a rubber solvent at approximately 150° C. or higher, a colloidal solution is easily obtained. Neither dispersions nor solutions are sticky. Dispersions of the powder in non-rubber solvents may also be disintegrated by mechanical means, but this requires a large amount of energy while there is no loosening effect of the swelling. The addition of dispersing agents is advisable in making dispersions.

Easily Sheeted on Mixing Rolls

Mealorub is easily sheeted on mixing rollers, thus demonstrating its non-vulcanized state. The formed sheet looks somewhat like crepe rubber, but because the cohesion of the particle is small, it is easily torn. In contrast with ordinary crude rubber, it is impossible to plasticize Mealorub without the addition of other substances. After prolonged milling, a softening effect is observable, but it is practically impossible to calender or form the resulting stiff material in the usual manner. By adding softeners, the plasticizing effect increases, but still insufficiently for most purposes.

It is possible, however, to mix large quantities of the new rubber powder into plasticized crude rubber. Using 85 parts of Purified Mealorub on 15 parts of crepe rubber, articles with a very low water-absorption were obtained by ordinary manufacturing methods. Sulfur and fillers were mixed with the rubber powder, which shortened mixing time. With the exception of the preparation of articles with a low water-absorption, little or no economical use of Mealorub is seen in the usual manufacturing of rubber articles. The applications which do suggest themselves, however, according to the Experiment Station, lie in

Note: This article is based on data furnished by Dr. G. M. Kraay, Director, Proefstation West Java, Buitenzorg, Java, N. E. I.

the field of derivatives, molding powders, in asphaltic-bitumen for use on roads, and other new uses of rubber.

It has already been determined that adding small quantities of raw rubber (up to ten parts) to an oil-base asphaltic bitumen raises the softening point and reduces the flow, while in many cases the hardness is also raised and sometimes both the ductility and the adhesive properties increase. In road construction, the addition of rubber to the asphaltic binder results in an apparently lower bitumen content of the wearing surface and leads to an improved non-skid surface. Actual road tests indicated an increase of the coefficient of friction from 0.4 to 0.7 when 7½ parts of rubber were used to 100 parts of bitumen. This test was made seven months after construction and on a wetted surface.

Dispersable in Molten Bitumen

Mealorub can easily be dispersed in molten bitumen when stirred and heated to 175° C. After the rubber powder has been added, stirring must be continued for another few minutes. Not only are reduced flow properties of asphaltic bitumen of importance in road work, but also in the coating of pipes and roofs.

To date, rubber solutions have been the starting point in the production of rubber derivatives. Although the Experiment Station has not actually conducted tests in this direction, it is believed that more rapid and efficient methods for the manufacture of these derivatives, and others, can be developed through the use of Mealorub. It seems possible to spray this new rubber powder in an atmosphere containing the agent with which the rubber must react, in gaseous or nebulous form. Should this theory prove practical, a method of manufacture without previous plastification of the rubber and without the use of rubber solvents might prove possible. It might also be possible to start with solutions or dispersions of Mealorub in rubber solvents. There is also the possibility of working with dispersions of Mealorub in other and more economical liquids than rubber solvents.

When using Mealorub, mixed with chemicals or resins, as a direct molding powder, it must be remembered that the particles are coated with a non-adhesive layer. These particles can only fuse together or with other substances at relatively high temperatures, approximately 140° C. or higher. When a non-porous, homogeneous vulcanized rubber is desired, all the particles must first flow together before vulcanization can be attempted. When vulcanization is faster than the flow process, the result is a porous material with poor mechanical properties. Hard and soft rubber articles may be made in the manner described, providing the article is not too thick to prevent homogeneous heating of the mixture.

No Patents on Applications

Mealorub is also said to offer a means for studying the effect of the addition of rubber to synthetic resins and vice-versa, of which practices little or nothing is known up to the present time. Studies in this field will be of considerable interest, with a view to modifying the properties of rubber to make it, for instance, more oil-resistant, and, on the other hand, to altering the properties of synthetic resins in order to make them more elastic.

The Proefstation West Java has not taken any patents on processes involving the application of Mealorub, nor has it any intention of doing so in the future, according to a publicized statement. Those interested in processes incorporating the new rubber powder as a raw material, however, are warned that many patents exist in various countries, several of them claiming the use of rubber powders in general. The Station ventures the opinion that many of these patents are of doubtful validity, but urges those contemplating the use of rubber powder to thoroughly investigate the patent position.

Yelkin "T"—Soybean Lecithin

A TECHNICAL grade of soybean lecithin, under the name of Yelkin "T", has been developed by Ross & Rowe, Inc., 75 Varick Street, New York City. It is a dual colloid, soluble in all vegetable and animal fats and oils, and in petroleum oils and solvents. In water, it swells and forms a colloidal solution.

Yelkin "T" is said to exhibit remarkable surface activity in oil solutions, reducing surface tension and substantially reducing interfacial tension at oil and water interfaces or oil and solid interfaces. An example of its use in oil solutions is as a wetting agent in the manufacture of paints where it has been determined that the use of a small quantity facilitates the complete wetting of the pigment by the vehicle.

Dilute solutions of lecithin in water have been found to be efficient in completely dispersing finely divided solids in aqueous dispersions. As little as .1 of 1% of Yelkin "T" will completely disperse material such as titanium dioxide and zinc oxide in water, according to Ross & Rowe. It also exerts a softening action on rubber, thereby facilitating the mastication and mixing of rubber and compounding materials.

Experiments indicated that this new material was an ideal thickening agent in processing latex and increased the stability of latex dispersions. Ross & Rowe therefore have developed a special lecithin material for this purpose, called Yelkin "S", which is more easily dispersed in water.

Ozone-Resistant Insulated Cable

IF an outside layer of sulfur-free, also unvulcanizable, rubber is put on the conductor of a cable, the layer lying beneath will remain soft and elastic after vulcanization, and will not crack as a result of attack by ozone, according to E. Bormann, of Germany, reported in a recent issue of the *News Edition* of *Industrial & Engineering Chemistry*. The insulation comprises the usual rubber mixture, which is then covered with a layer of sulfur-free rubber. A textile plait finishes the job.

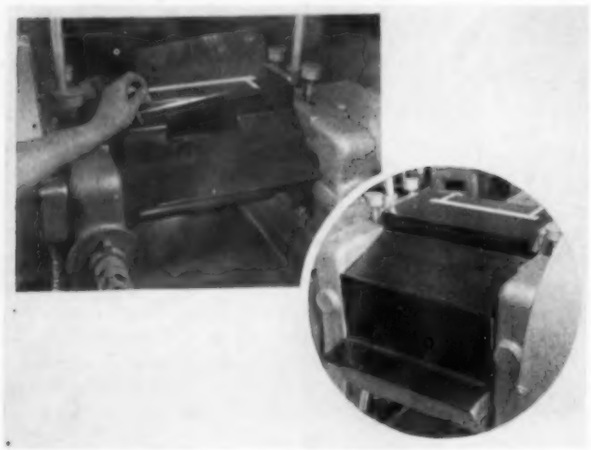
In the construction of high-tension cables that must have a metal mantel, use is made of the fact that rubber can be made conducting by the addition of lampblack. The outside layer and the one next to the conductor consist of this conducting rubber, which on vulcanization forms a single unit with the intermediate layer of insulation rubber. No ozone can be formed between the conductor and the insulation, according to the report.

Were any articles published on the surface treatment of rubber during 1936? The answer to this and similar questions, with all data given as to original sources, will be found in the "Bibliography of Rubber Literature for 1936"—part of the 1937 RUBBER RED BOOK. Paper-bound copies, $2.00; cloth-bound, $3.00.

New Equipment

Shield for Mixing Mills

IN practically all factories and laboratories where rubber mixtures incorporating carbon black are handled on mixing mills, a dust problem is present. The laboratory of the Midwest Rubber Reclaiming Company, at East St. Louis, Illinois, was no exception



Front and rear views of shield for mixing mill.

to this rule. Members of the Midwest laboratory staff, however, recently put their heads together and created a simple shielding device, made of metal, which has enabled them to cut down on laundry bills considerably. This shield, which the accompanying photographs describe far better than mere words, is said to have saved laboratory time and increased the accuracy of mixing at the Midwest plant. It is not only good for mixing carbon black batches, but is reported excellent for incorporating mineral rubber or any compounding ingredients which have a tendency to jump out of the mill or "fly." The use of a cellophane window on the front of the shield enables the operator to observe the mixing operation without disturbing the shield.

Controlling Rubber Machinery

TWO notable electrical installations made during the past year in tire manufacturing plants had to do with bridging over shut-downs caused by lightning, and applying the largest and highest-voltage motors and controls ever to drive tire building machinery, according to a review of developments in the electrical industry during 1938 by Guy Bartlett in the January, 1939, issue of the *General Electric Review*.

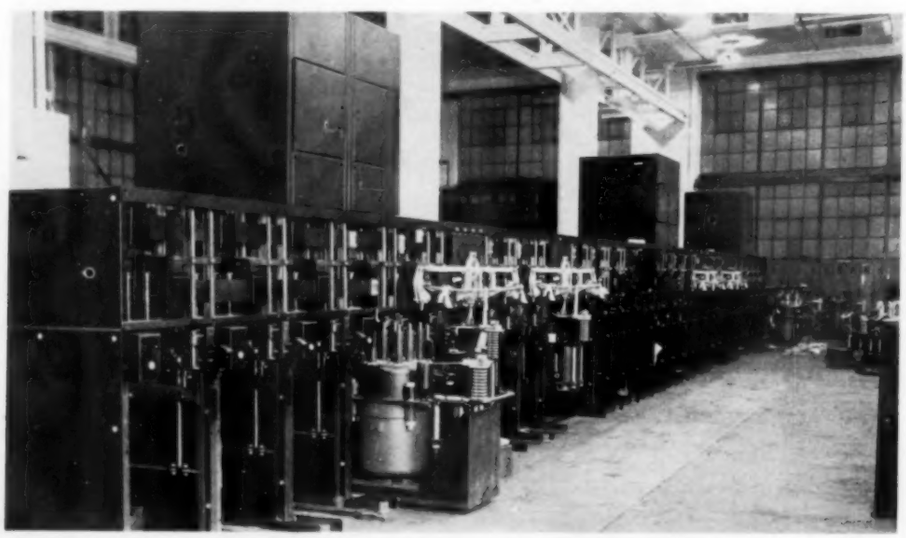
Lightning shutdowns were bridged over for the first time in an industrial plant by the automatic resynchronizing of the main motor drives installed in one of the new tire plants. Upon an arc-over of the transmission line supplying power to the plant, carrier current control clears the line from the generating station. The synchronous motors are then disconnected from the line to prevent pump back, after which the line contactors are reclosed and the motors are resynchronized upon return of power, which usually occurs within a fraction of a second.

Method of Controlling Shutdown

If power does not return within the limit of time delay undervoltage devices, shutdown occurs in the usual manner subject to manual restart. On motor-generator sets the d-c generator fields are momentarily weakened to unload as a means of assisting quick resynchronizing. All mill-control circuits are d-c operated from a flywheel set so that control power is maintained during the disturbance.

The largest and highest voltage motors and controls ever to drive automobile-tire manufacturing machinery were placed in service during the year. This installation consists of three 1250-hp, 13,200-volt synchronous motors and magnetic forward, reverse, and dynamic braking controls. The motors are completely enclosed, each with its own closed-circuit ventilating system equipped with surface air coolers.

The controls are placed directly in the incoming power-supply line and have a short-circuit capacity of 250,000 kva. They are equipped with a new type mechanical interlocking system to preclude any possibility of forward and reverse breakers being closed simultaneously, and to operate a spring-set dynamic-braking circuit breaker to give the same high-speed braking cycle customary with small low-voltage controls.



General Electric metal-clad switchgear (Type MI-6) for 13,800-volt service. This apparatus, used for forward reversing and dynamic-braking service for rubber mill motors, is installed in the new tire factory of Ford Motor Co.

Book Reviews

Proceedings of the Rubber Technology Conference. Edited by T. R. Dawson and J. R. Scott. Published by the Institution of the Rubber Industry, 12 Whitehall, London, S.W. 1, England. 7x10 in. 1,206 pp. $12.00

(*Available from Book Department,* THE RUBBER AGE)

All of the 103 papers delivered during the Rubber Technology Conference held in London, England, from May 23 to 25, 1938, under the auspices of the Institution of the Rubber Industry, appear in this comprehensive book. Each paper is preceded by a brief abstract and is complete to the discussions which followed the actual presentation. Furthermore, many of the papers have been corrected and partially revised since being delivered at London.

The papers appear in the book in the same manner with which they were given at the Conference; that is, they are divided into subjects and grouped into "sessions." The classifications in which the papers are grouped are: Plantation Subjects; Latex; Chemistry; General Technology; Synthetic Rubber-Like Materials; Compounding Materials; Durability; Physics; and Applications. The papers cover almost every conceivable phase of rubber technology from the physiology of latex-yielding plants to the marketing of manufactured rubber products, and collectively they constitute the most remarkable collection ever published between covers.

In addition to the papers themselves, this book is of value in that it is an accurate report of the Conference proper. Its introduction tells of the preliminary work leading to the Conference and outlines the general conduct of the actual sessions. Other sections give a complete list of the officers, committees and officials; company and individual supporters; official delegates (by country); those attending; etc. Speeches made at the opening session are included while reports are given on the various receptions, luncheons, banquets and visits.

The book includes a list of abbreviations used in literature references, complete to full names and addresses; a numerical index to papers; and an authors' index. A number of trade advertisements appear at the end. For the complete list of papers delivered at the Conference readers are referred to the June, 1938, issue of THE RUBBER AGE.

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Toxicity of Industrial Organic Solvents. Compiled by Ethel Browning. Published by the Chemical Publishing Co. of N. Y., Inc., 148 Lafayette St., New York City. 5½x8½ in. 388 pp. $3.50.

This book, published for the first time in an American edition, represents Report No. 80 of the Medical Research Council of the Industrial Health Research Board of Great Britain. It was compiled by the author under the direction of the Council's Committee on the Toxicity of Industrial Solvents and comprises extracts from all the existing literature and information up until late 1935. As the title indicates, the book discusses the problems raised in industry by the use of organic solvents, including many used in the rubber industry; indicates the most suitable points of attack to overcome the problems; and serves as an excellent aid to investigators whose task it is to work in this field of experiment. The 8 chapters are divided into groups of organic solvents, as follows: Hydrocarbon Group; Chloro Compounds; Alcohols; Esters; Cyclohexane Derivatives; Ketones; Glycol Group; and Miscellaneous. The properties, manufacture, uses and effects of each solvent are treated with in every case. Extensive references are given in each instance. A general subject index is included.

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An Introduction to Industrial Rheology. By G. W. Scott Blair. Printed in Great Britain. Available from P. Blakiston's Son & Co., Inc., 1012 Walnut St., Philadelphia, Penna. 4¾x7¼ in. 144 pp. $2.25.

The large number of important physical and chemical principles involved in rheology, best described as the study of materials which "flow," are surveyed and summarized in this new book, the first of its kind to be published. Actually, the book comprises ten lectures, slightly modified, delivered by the author as part of his course on colloids at the Sir John Cass Technical Institute (in England) last year. Practical data is furnished in such a manner that it may be put to use by technologists in various industries. The entire subject of rheology, from its historical background to its application in the testing of commercial materials, is treated with in the twelve chapters contained in the book. Extensive references to the literature appear at the end of each chapter. References to rubber technology appear in practically every chapter. A glossary of rheological terms, and author and subject indexes are included. This book is recommended to all chemists and technologists who wish to secure a picture of the progress made by rheology to date.

Booklets, Catalogs, etc.

Micromax Condensate-Purity Instruments for the Steam Plant. Leeds & Northrup Co., 4907 Stenton Ave., Philadelphia, Penna. 7¾x10½ in. 20 pp.

This catalog shows how a knowledge of condensate conditions helps to effect important operating economies and describes an electrical method for continuously determining variations in condensate purity. It also describes Micromax recorders which automatically draw a chart record of condensate conditions, and, if contamination occurs, actuate an alarm to warn the operator, or in addition, operate a motorized valve to divert impure condensate to waste. Several illustrations of typical applications are shown.

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Color in Rubber. By A. J. Northam and S. G. Byam. (Report No. 38-10). Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Wilmington, Delaware. 6¼x9¼ in. 24 pp.

The various factors involved in selecting pigments for use in rubber, such as the effect of rubber and compounding ingredients and that of various methods of curing, are clarified and discussed in this report. Economic considerations and pigment properties are dealt with. Special attention is given to latex pigment colors. The report includes a color chart and a glossary of color terms. A "Color Bibliography" is also part of the report.

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Aminox—An Antioxidant. Naugatuck Chemical Division of U. S. Rubber Co., 1790 Broadway, New York City. 8¾x11¾ in. 8 pp.

Aminox, a general purpose antioxidant for use in rubber, and said to be the newest product in the ketone diarylamine class of antioxidants, is described in this bulletin. Data is given on its properties, uses, etc. Formulas incorporating the use of the new antioxidant in tire treads, tube stocks, footwear, mechanical goods, wire insulation and latex films are given, with data on tensiles and aging given in each instance.

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Aero AC 50. American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York City. 8½x11 in. 46 pp.

This booklet gives a number of formulas incorporating Aero AC 50 in a variety of stocks ranging from tire treads to hot water bottle compounds. Data on flexing, tensile, abrasion, modulus, etc., on a number of these stocks is given. Aero AC 50 is a delayed action activator for use with mercaptobenzothiazole or its derivatives. The booklet includes many combinations, several of which suggest additional possibilities of interest to rubber chemists.

Editorial Comment

Consensus of Opinion

THE consensus derived from the year-end statements and predictions of the leaders of the rubber industry would indicate that the coming year will prove very satisfactory from the standpoint of sales and income. As for the past year, although it got off to a poor start and never caught up with the volume recorded for 1937, business improvement in the past several months has served to bring the volume up to a point where annual comparisons do not look half as bad as earlier predictions would have had us believe.

An expansion of more than 15% in tire sales is confidently expected for 1939. This would bring tire sales up to approximately 50,000,000, or about the 1935 level, as compared with the approximate 43,000,000 produced in 1938. The gain will be primarily in original equipment tires, since current estimates of 1939 automobile production call for 3,400,000 cars and trucks, as compared with approximately 2,600,000 in the past year. Replacement tire sales, which held up remarkably well in 1938, are also expected to show further improvement.

As a general rule, the rubber industry, like most others, fared less well in 1938 in volume of production than in the previous year. Naturally, the reduced rate of activity, as Mr. A. L. Viles, president of the Rubber Manufacturers Association points out, tended to create higher costs, and the smaller volume of total business available intensified competition. Fortunately, however, the price structure held firm throughout the year. Also fortunate is the fact that it will not be necessary for the rubber manufacturers to write off any great inventory losses, as was the case at the end of 1937. Because of these two factors, the earnings of the rubber industry as a whole for 1938 will prove to be fair (when reported), when consideration is taken of the generally unfavorable business conditions that prevailed for the greater part of the year.

The coming year should witness a continuation of the strides taken by rubber into fields of new uses and applications. These will include the tremendous transit industry, which uses rubber springs and "sandwich" rubber wheels; the furniture industry, which is rapidly turning to the use of sponge rubber as an upholstery material; the clothing industry, already absorbing large quantities of sheet materials made from both natural and synthetic rubber bases; the aeronautical industry, for which special products are constantly being added; and dozens of other industries manufacturing products which can utilize the peculiar properties of rubber and its derivatives to advantage and profit.

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Overshipment of Quotas

FOR the first time since the inauguration of the current restriction scheme the International Rubber Regulation Committee is confronted with quota overshipments from signatory countries of substantial proportions. The plan itself, however, allows overshipments of 5% of permissible net exports to be made up during the following calendar year. At this writing it is positive that both Burma and Ceylon will have more than a 5% carryover by the end of the year.

To all apparent purposes, the restriction agreement does not provide any penalties for violation of this kind. This situation raises a delicate question, offered in a recent issue of the *Journal of Commerce, i.e.*, not much harm can be done as long as only some of the smaller rubber producing countries overship their quotas, but what would happen if Malaya or the Netherlands East Indies took the same privilege?

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Thank You

THE members of the staff of THE RUBBER AGE take this method of thanking their many friends in the rubber and allied industries for their thoughtfulness in remembering them during the Christmas Holidays by sending cards, calendars and mementos, every one of which was duly appreciated.

CURRENT • NEWS
of the Rubber Industry

JANUARY, 1939

INDUSTRY'S LEADERS OPTIMISTIC FOR 1939

Leaders of the rubber industry invariably expressed optimism with regard to sales and income possibilities during the coming year in their usual year-end statements. The heads of tire companies were agreed that 1939 will witness a decided improvement in original equipment tire sales, while replacement tire sales will do no worse than hold the 1938 level, which was generally considered satisfactory.

P. W. Litchfield, president of Goodyear, calling the attention of the trade to the fact that 1939 holds special significance in that it marks the centennial of Charles Goodyear's discovery of vulcanization, pointed out that the uses of rubber are so widely diversified that the same basic raw material serves to produce thin, transparent sheets as well as conveyor belts measuring more than two miles in length.

"In view of the high rate at which automobile assemblies are proceeding," said Mr. Litchfield, "tire production and sales should continue at a favorable level for some months to come." He also said a large demand for replacement tires would soon be evident from those who purchased new cars in the 1935-37 period.

Statement of David Goodrich

Total tire shipments of some 48,000,000 casings in 1939, which would represent a gain of 16% over estimated shipments of 43,000,000 tires in 1938, is foreseen by David M. Goodrich, chairman of the Goodrich directorate. He said that while tires are, and at least for some years will continue to be, the largest single item produced by the industry, there is every indication that, with new and important products being developed, the rubber industry is now standing on the threshold of the most significant period in its history.

Mr. Goodrich looks for particular expansion in the use of synthetic rubber and rubber-like materials, the properties of which, in some cases, excel even those of natural rubber for specific purposes.

Lauding the tire industry for its proven ability to weather adverse conditions without resorting to uneconomic and disastrous price wars, John W. Thomas, president of Firestone, faces 1939 with optimism. "We are impressed that there is a growing feeling of optimism throughout the country about the future," Mr. Thomas recently said in a statement to the company's stockholders, "which is warranted in many territories by a definite improvement in conditions."

General business should show steady improvement in 1939, according to William O'Neil, president of General Tire, because there is a growing demand for all classes of merchandise. "Bad politics can slow up the demand for goods but cannot permanently dam up this demand," said Mr. O'Neil. He also stated that a greater percentage of the company's dealers made money in 1938 than during any other year in General's history. Credit conditions are excellent, in his opinion.

Colonel Charles E. Speaks, president of Fisk Rubber, made the following statement: "Generally, 1939 holds a promise of rising national income, increased production and, consequently, wider employment gains. The tremendous jump in automobile production, which far exceeded the industry's expectations, combined with a steady increase in the nation's motoring mileage, will prove vital factors in raising tire sales."

Saving Seed Beans

Soft rubber rollers on the wringer of an ordinary washing machine have inspired an invention expected to revolutionize the seed bean industry. Engineers at the College of Agriculture of the University of California, endeavoring to design a harvester that would not injure beans and thereby insure seed beans for a higher percentage of germination, conceived the idea of replacing the spiked cylinders used in bean harvesters with rubber rollers. With the new rollers, germination loss is said to have been reduced from 15% to less than 1%.

Vultex Patents Valid

As this issue was going to press we received word that the U.S. Circuit Court of Appeals handed down a decision on January 10 in the suit between the Vultex Corporation of America and the Heveatex Corporation. Briefly, this decision held both Vultex patents involved in the suit (U.S. Patents 1,443,149 and 1,682,857) to be valid, but found no infringement. Additional data will appear in our next issue.

SEIBERLING BIDS IN ITS OWN FUNDED DEBT

The Seiberling Rubber Company, Akron, through W. A. M. Vaughan, vice-president, bid in its own certificates of deposit, representing the entire funded debt of the company, outstanding in the amount of $2,350,000 of 6% debentures, for $752,000, or 32% of the face value of the debentures, at an auction held on December 28 in New York City by Adrian H. Muller & Son, security auctioneers. The certificates were part of the collateral securing bank and other notes of the Ohio Goodyear Securities Company, believed to be a private holding company owned by Edgar B. Davis. It has no connection with the Goodyear Tire & Rubber Co.

Originally Sold in 1930

The $2,350,000 of 6% debentures, of which the maturity was recently extended to November 15, 1939, and on which interest has been paid to November 15, 1938, were originally sold in 1930 to a group of banks and other large investors and never were in public hands. In all, $3,100,000 of debentures were issued, but $750,000 of these were retired in 1931 by the company at face value. The remaining debentures were deposited under a plan for financial readjustment several months ago, but no arrangements for reorganization were completed at the time. The Ohio Goodyear Securities Company was the medium under which the Seiberling debentures and other unidentified collateral were pledged with the banks and other investors.

From the standpoint of Seiberling, according to financial circles, it has reacquired its debt by the expenditure of $752,000 in cash for the certificates of deposit, plus the payment of expenses and a capital gains tax amounting to 19% of the balance of $1,598,000 in the face amount of the debt, or $303,620. Seiberling has already made complete payment on its purchase.

Elsewhere in this issue is contained the report of the Seiberling company for its fiscal year ended October 31, 1938. A net profit of $297,494 is reported, which is the best record of the company since 1931 when a profit of $500,347 was made. The report indicates that business continues to show improvement.

FIGHT RAGES FOR CONTROL OF AETNA

The dispute as to which of two opposing factions shall manage and control the Aetna Rubber Company of Cleveland and Ashtabula, Ohio, has finally reached the courts. As far as can be determined, the following series of events preceded the court action:

A special meeting of Aetna stockholders was forced on December 27 by a so-termed insurgent group headed by Stanley T. Campbell, who managed the company in 1934, 1935 and 1936, and which has been seeking to oust the present management for some time. In a letter to stockholders soliciting proxies, Mr. Campbell and others proposed two new directors to replace Charles A. Heil and M. C. Teasdale. Mr. Heil is the incumbent chairman of the board, Mr. Teasdale is secretary-treasurer, while Charles Mashek is president.

Differences of Opinion

When proxies were counted at the special meeting, Mr. Heil, presiding, declared his faction had won and quickly declared the meeting adjourned. The Campbell group countered with a declaration that the meeting was not adjourned and in a session of their own voted to oust Messrs. Heil, Mashek and Teasdale, and elected William C. Young (formerly with Goodyear) and R. A. Gillis as members of the board of directors. Messrs. Campbell, Young and Gillis then held a director's meeting and named Mr. Campbell president and general manager and Robert R. Christian (of McDonald, Coolidge & Co.) as vice-president and treasurer.

The dispute as to whether or not there were sufficient proxies to elect one side or the other centers on the question as to how Aetna's preferred stock should legally be voted. The incumbent management contends the preferred should have 89 votes to each share of common, while the insurgents claim the preferred and common should vote alike.

Further Developments

On December 28, Mr. Campbell and Mr. Christian, the so-called insurgent officers, entered the plant offices of Aetna at Cleveland and sought possession of company records and correspondence with the aid of policemen. They failed, however, in their effort to dislodge the incumbent management, which was flanked by private detectives. The policemen left after the private officers promised to prevent any physical clash between the two groups. Subsequently, counsel for the two factions failed to reach an attempted agreement.

On January 3 the disputed management of Aetna Rubber was thrown into the courts with the filing of a petition in *quo warranto* in the Court of Appeals at Cleveland. In keeping with the law the petition was filed by the County Prosecutor, but actually represents the claim of the incumbent officers to continue in their present positions. Messrs Campbell, Gillis, Young and Christian were named as defendants.

The legal action asked the court to instruct the defendants to appear and to show cause why they should press a claim to the control of the company, while a motion filed with the *quo warranto* action asked that the defendants be restrained from demanding company funds and records, asserting claims to the mail, interfering with employees, and trespassing on the property.

Hearing Set for January 19

On January 5, Judges Levine and Leighley, who heard the plea, set January 19 as the date for a hearing on the action. The defendants in the action were given permission to "inspect" the property, but were ordered to refrain from interference with its operation until the hearing. The incumbent officers, headed by Mr. Mashek as president, were ordered to post a bond of $6,000 to protect the company from any loss it might meet as a result of the actions of the incumbent officers.

The Aetna Rubber Company manufactures battery boxes, refrigerator supplies and various other hard rubber specialties. The company is reported to have lost money consistently since 1928. It employs approximately 200 in its Cleveland plant, while its large plant at Ashtabula has been virtually idle since a strike in 1934 and movement of most of its operations to Cleveland.

Mr. Campbell, leading the fight to wrest control from the present management of Aetna, voluntarily left the company in 1936 to take another position which, it is reported, he no longer fills. The minority group he leads was successful in blocking the sale of Aetna's plant at Cleveland to Akron interests for a reputed $135,000 in cash early last year.

Coming Events

Jan. 18. Ontario Rubber Division, Canadian Chemical Ass'n., University of Toronto, Toronto, Canada.

Jan. 20. Akron Group, Rubber Division, A.C.S., City Club, Akron, Ohio.

Feb. 7. Los Angeles Group, Rubber Division, A.C.S., Mayfair Hotel, Los Angeles, Calif.

Feb. 10. Chicago Group, Rubber Division, A.C.S., Hotel Sherman, Chicago, Illinois.

April 3-7. 97th Meeting, American Chemical Society, Baltimore, Md.

May 22-June 8. World Automotive Engineering Congress, auspices S.A.E., New York, Indianapolis, Detroit and San Francisco.

June 26-30. Annual Meeting, A.S.T.M., Chalfonte-Haddon Hall, Atlantic City.

CONGRESS MAY PROBE THE RUBBER INDUSTRY

On January 4, shortly after the new Congress convened, Representative John Martin of Colorado introduced a bill in the House of Representatives which, if passed, would authorize the Federal Trade Commission to determine whether unfair competition existed in the sale and distribution of tires from factory through retail store to purchaser. It is understood that Senator John E. Miller of Arkansas is considering introducing a similar bill to the Senate.

Both Senator Miller and Representative Martin introduced similar bills late in the 1938 session, but neither was passed. The former recently stated that he consented to the pigeon-holing of his resolution upon a promise that the so-called Monopoly Committee would cover the same ground. Representative Martin headed a sub-committee which reported favorably on the tire inquiry last year but the measure was lost in the adjournment rush.

At the time of introducing his measure, Representative Martin said: "The evidence before our committee clearly indicated a trend toward monopoly and if this trend is permitted to continue the 50,000 remaining independent dealers will go the way of the 100,000 who have been forced out of business by company stores since 1935 and there will be no such thing left as competition in manufacturing and independent merchandising."

Wants Facts Brought Out

Senator Miller's resolution, if introduced, would also urge an investigation of tire manufacturers' practices, with special emphasis on the growth of manufacturer-owned retail outlets. He said that his course would probably be determined by the attitude of the special committee now investigating monopolistic practices and that he was not greatly concerned over who makes the investigation "as long as the facts are brought out."

The Temporary National Economic Committee, generally referred to as the Monopoly Committee, has thus far made no move to undertake an inquiry as to distribution methods practiced by tire manufacturers, although Representative Martin is understood to have submitted a memorandum covering phases which he believed should be covered. Demands for such an investigation have long been pressed by various independent tire dealer bodies, particularly the National Association of Independent Tire Dealers, Inc., headed by George Burger as general manager.

The Rubber Manufacturers Association has fought the various measures intended to restrict manufacturers from operating retail units, defending company-owned stores on the ground that many independent dealers in leading marketing are and were unable or unwilling to meet the competition of mass distributors who in 1928 and 1929 established large chain organizations for the sale of tires and other merchandise.

CHARGE U. S. RUBBER WITH DISCRIMINATION

Charges of violation of the Robinson-Patman Act through discriminatory price arrangements made with certain dealers through various subsidiaries were filed against the United States Rubber Company and its subsidiary, the United States Tire Dealers Corporation, by the Federal Trade Commission on January 9. According to the complaint, the parent company uses the dealer subsidiary as the agency through which other subsidiaries make the allegedly illegal prices to preferred customers.

Summarized, the practices complained of in the F.T.C. charges were as follows:

Four Major Charges

(1) Sale of special brand tires at prices lower than the prices charged to other customers for tires of like grade bearing the usual U. S. Rubber brand designations. Concerns said to be purchasing the special branded tires included Montgomery Ward & Co., Atlas Supply Co., Western Auto Supply Co. of Los Angeles, and the Arkansas Fuel Oil Co.

(2) Sale of regularly branded tires to certain large volume consumers at lower than regular prices.

(3) Retail sales through stores owned and operated in twenty principal cities by the respondents of regularly branded tires at a discount to certain users and customers, including the so-called "commercial accounts."

(4) Special sales terms to a group of large oil companies having some 2,800 service stations throughout the country, including Socony-Vacuum Oil Co., American Oil Co., Pan-American Petroleum Corp., and Tidewater Associated Oil Co. These companies allegedly get respondent's tires on terms at least as favorable as the best terms accorded to wholesale dealers and, in addition, receive 7½% commission on tires sold to their oil and gas stations by respondents and their distributors.

Only Two Firms Cited

Although the complaint filed by the Federal Trade Commission mentions the roles of various U. S. Rubber subsidiaries in connection with the alleged illegal practices, and also mentions a number of the allegedly preferred customers (as noted above), only the parent company and the U. S. Tire Dealers Corporation are named as respondents. The effect of the practices, according to the complaint, is to lessen substantially competition between tire companies and between the allegedly preferred customers and other regular customers of U. S. Rubber.

In answer to inquiries concerning the charges, Mr. F. B. Davis, Jr., president and chairman of the board of U. S. Rubber, said that the company always had and would continually endeavor to conduct its business in accordance with the law and in the interest of the public, including the company's dealers, employees and stockholders. In his belief, the Federal Trade Commission's approval will be forthcoming once U. S. Rubber's merchandising policies are fully explained.

Waynway Rubber Assigns

A. N. Wayne and Herbert N. Wayne, doing business as the Waynway Rubber Company, in Los Angeles, California, made an assignment under date of December 12, 1938, to Charles R. Warfel, 617 South Olive Street, Los Angeles, for the benefit of creditors. At a meeting of creditors on December 16 a committee of five of the largest creditors was appointed, as follows: S. E. Brennan (Muehlstein), John Mason (Union Rubber), F. W. Woerner (C. P. Hall Co.), H. J. Spellman (Spellman Electric), and H. M. Royal (H. M. Royal, Inc.). A 50% settlement was believed in prospect.

Climax Moves Offices

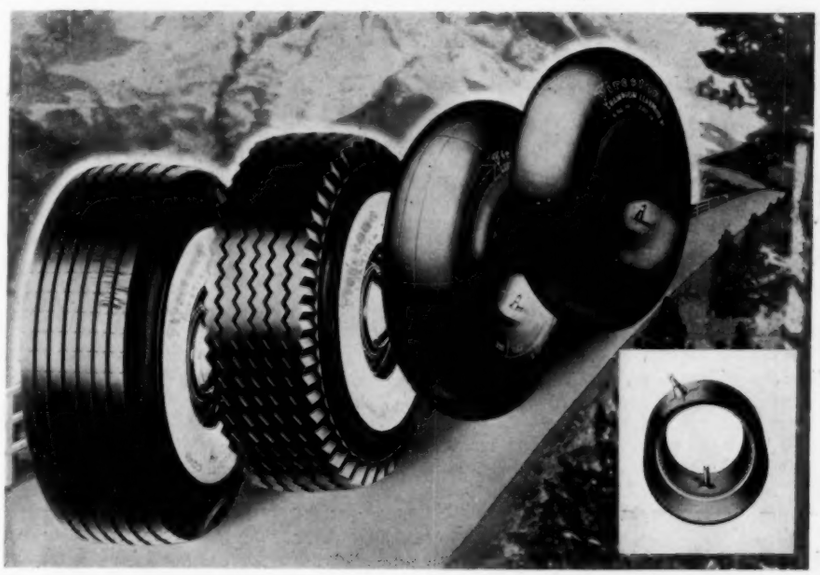
Effective January 15, the offices and showrooms of the Climax Rubber Company will be located at 1440 Broadway, New York City. The company, manufacturers of drug sundries and proofed goods, maintains a factory in Brooklyn.

J. E. TRAINER HEADS FIRESTONE PRODUCTION

J. E. Trainer, for many years associated with the Babcock & Wilcox Company as general superintendent, joined the Firestone Tire & Rubber Company on January 3 as general production manager of all Firestone plants. Mr. Trainer, who resides in Akron, was in charge of manufacturing operations of all Babcock & Wilcox factories. The position of general production manager of Firestone to which Mr. Trainer was named is a new one, Firestone officials pointed out. He will be responsible for production at all domestic and foreign plants.

Mr. Trainer is a World War veteran, having served as a lieutenant in the Chemical Warfare Division of the United States Army. He was graduated from Pratt Institute of Science and Technology, Brooklyn, N. Y., in 1914. He has long been active in civic affairs in Barberton, Ohio, and has served as head of the Community Fund and as a member of the Barberton Chamber of Commerce. Mr. Trainer helped organize the Barberton Brookside Club and is also a member of the Portage Country Club.

FOUR NEW FIRESTONE PRODUCTS MAKE THEIR BOW



Four newcomers to the line of products featured by the Firestone Tire & Rubber Company for 1939 are shown above. These are, left to right, the Imperial Tire, the Champion Tire, the Life Protector and the new Champion Leakproof Heavy Duty Tube. The inset shows a section of the Life Protector, particularly the exclusive "safety valve" which holds air after a blowout, allowing ample time for the driver to make a safe, normal stop, according to Firestone.

The new Imperial tire is made of "Rayodipt" cord construction and has a tread design 20% deeper than ordinary tires, thus providing proportionately greater non-skid mileage. The tread incorporates seven circumferential ribs with cured-in non-skid elements. The Champion tire is distinguished by a new, flatter tread design, incorporating six circumferential tread bars with rugged, angled edges. The tread has twelve flexible, non-skid angled edges that grip the road securely.

The Life Protector is a tire within a tire, being made of rubber with two reinforcement plies of cord. The construction of the new Leakproof tube includes a special lining that completely seals the inner surface of the tube, thereby preventing air seepage common to most ordinary tubes.

NELLEN AND HAYNES HEAD NEW YORK GROUP

Approximately 400 members and guests attended the annual combination Meeting and Christmas Party of the New York Group, Rubber Division, A.C.S., held on December 16 at the Building Trades Club in New York City.

Blank & Stoller

Arthur Nellen **Charles Haynes**

The meeting featured election of officers for the 1939 term, a program of fine entertainment, and distribution of prizes to holders of lucky numbers.

The Nominating Committee, headed by Carl J. Wright of the General Atlas Carbon Co., presented the following slate of officers, all of whom were unanimously elected: *Chairman*, Arthur H. Nellen (Lee Tire); *Vice-Chairman*, Charles R. Haynes (Binney & Smith); *Sergeant-at-Arms*, Wm. T. Malone, Jr. (General Supply & Chemical Co.); *Secretary-Treasurer*, B. Brittain Wilson (*India Rubber World*).

Newly-elected members of the Executive Committee, to serve for three years, are I. Drogin (Huber), S. G. Byam (DuPont) and G. W. Winchester (Norwalk Tire). The following members elected last year will continue to serve for two more years: D. C. McRoberts, R. Berkowitz, and John Ball; and for one year: Charles R. Haynes, E. W. Schwartz, and K. J. Soule. Peter P. Pinto (THE RUBBER AGE), the retiring Secretary-Treasurer, becomes *ex officio* member of the Executive Committee.

During the usual excellent dinner, the crowd was entertained by a roving guitar player whose repertoire apparently included every known song. After dinner, H. Walter Grote, of the United Carbon Company, displayed some of his famous sleight-of-hand feats and as usual was very well received. The scheduled Mystery Technical Paper was then delivered by "Mr. X," in the person of Walter C. Braun. Mr. Braun told of the discovery of a white carbon black, of a method for liquefying rubber, and of other astounding technical departures, and while his remarks will never appear in the technical literature, the amazing developments were instantly grasped and appreciated by his audience.

At the conclusion of the brief program, approximately 170 prizes, ranging from golf balls to portable typewriters, were distributed to holders of lucky numbers. These prizes were made possible by the cooperation of the following firms, to whom a vote of thanks was accorded:

Admiar Rubber Co., Akron Standard Mold Co., L. Albert & Son, American Cyanamid & Chemical Corp., American Zinc Sales Co., Anaconda Sales Co., C. A. Bartle, Binney & Smith Co., Godfrey L. Cabot, Inc., Carter Bell Mfg. Co., Continental Carbon Co., DuPont, Farrel-Birmingham Co., Inc., Flintkote Co., General Atlas Carbon Co., Givaudan-Delawanna, Inc., C. P. Hall Co., J. M. Huber, Inc., Imperial Paper & Color Corp., *India Rubber World*, I. B. Kleinert Rubber Co., Monsanto Chemical Co., H. Muehlstein & Co., Inc., National Rubber Machinery Co., National Sherardizing & Machine Co., Naugatuck Chemical, N. J. Zinc Sales Co.

Paracord Co., Parrot Speed Fastener Corp., Pequanoc Rubber Co., Rare Metal Products Co., Reinhold Publishing Corp., Revertex Corp. of America, THE RUBBER AGE, St. Joseph Lead Co., A. Schrader's Son, A. Schulman, Inc., Somerset Rubber Reclaiming Works, Southwark Mfg. Co., Stamford Rubber Supply Co., C. J. Tagliabue Mfg. Co., Thiokol Corp., Thompson, Weinman & Co., Tingley-Reliance Rubber Co., Titanium Pigment Corp., United Carbon Co., R. T. Vanderbilt Co., Vansul, Inc., Wishnick-Tumpeer, Inc. Table favors, in the form of humorous booklets, were distributed by the Henry L. Scott Co.

Canadian Group Meets

Approximately 90 members and guests attended a meeting of the Ontario Rubber Division of the Canadian Chemical Association held at McMaster University, Hamilton, Ontario, on December 7th. The main speaker was E. R. Bridgwater, manager, Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., who delivered his paper on "Evaluation of Synthetic Rubber-Like Materials." This paper, which has previously been presented to various rubber groups, treats with the testing of materials to determine their suitability for various service conditions. The next meeting of the Group is scheduled for January 18 at the University of Toronto at which Dr. A. A. Somerville, of the R. T. Vanderbilt Company, will speak on "How to Kill a Business." A report of this meeting will appear in our next issue.

CHICAGO RUBBER GROUP HOLDS LADIES' NIGHT

Over 250 members and their ladies attended the annual Christmas Party and Ladies' Night Meeting of the Chicago Group, Rubber Division, A.C.S., held at the Hotel Sherman in Chicago on December 9. A reception was held in the Louis XVI Room of the hotel prior to the dinner. After the reception, members and guests went to the College Inn of the hotel where they were assigned to pre-arranged tables.

An excellent dinner was served in the College Inn and members and guests were entertained by a 15 act floor show especially arranged for the occasion. Each lady present was given a handsome souvenir before the evening was over. The following companies donated cash and prizes which helped make this affair one of the most memorable held by the Group to date:

Akron Standard Mold Co., L. Albert & Son, American Zinc Sales Co., Binney & Smith Co., Godfrey L. Cabot, Inc., Cleveland Liner & Mfg. Co., Continental Carbon Co., DuPont, General Atlas Carbon Co., Herron & Meyer, J. M. Huber, Inc., International Smelting & Refining Co., Kraft Chemical Co., Inc., Loeb Equipment Reclaiming Co., Monsanto Chemical Co., H. Muehlstein & Co., Inc., Naugatuck Chemical, N. J. Zinc Sales Co., A. Schulman, Inc., Thiokol Corp., United Carbon Co., R. T. Vanderbilt Co., Wishnick-Tumpeer, Inc.

The next meeting of the Group will be held at the Hotel Sherman in Chicago on Friday, February 10. Dinner will be served as usual in the College Inn of the hotel and members and guests entertained by an excellent floor show. J. K. Stewart and D. D. Rubek will present a paper on "The Status of Petroleum Rubber Solvents." Cost of tickets is $2.10 each, and they may be secured from Ben W. Lewis, c/o Wishnick-Tumpeer, Inc., Tribune Tower, Chicago, Ill.

R. I. Rubber Club Meets

The Rhode Island Rubber Club was scheduled to hold its winter meeting at the Narragansett Hotel in Providence on January 13. Bowling was to be indulged prior to the usual dinner. Scheduled speakers included Dr. Norman A. Shepard, director of technical service for the American Cyanamid & Chemical Corporation, and Lewis Bellem, Jr., the man who installed the radio sending station on Pitcairn Island. A report on the meeting will appear in our next issue.

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LIBERAL WORKING SAMPLE FURNISHED FREE

FINANCIAL NEWS

SEIBERLING REPORTS BEST YEAR SINCE 1931

For the year ended October 31, 1938, Seiberling Rubber Company reports a net profit of $297,494, after provisions of $251,581 for depreciation, $219,098 for interest charges, and $150,000 for Federal income and undistributed profits taxes. This is equal, after annual dividend requirements on 14,745 shares of $100-par 8% cumulative preferred stock, on which there is an accumulation of unpaid dividends, to 66 cents each on 271,106 shares of no-par common stock. In the previous fiscal year, Seiberling reported a net loss of $10,443.

The best record previous to 1938 for the company was in 1931 when a profit of $500,347 was reported. The only year since then, and until now, in which Seiberling showed a profit was in 1936, when net profit of $123,385 was reported. Net sales for the fiscal year recently ended amounted to $8,142,386, which compares with $8,807,425 in the previous year.

According to the consolidated balance sheet as of October 31, 1938, Seiberling had total current assets of $3,062,947, including $369,668 cash on hand and in banks, and $1,517,878, including reserves, in notes and accounts receivable. Total current liabilities were listed at $860,768. The company values its plant and equipment at $4,385,791, less $2,759,311 as reserve for depreciation.

In a statement accompanying the report, J. P. Seiberling, president of the company, said that profit results were attributable in part to four Seiberling products, *i.e.*, the new Safety tire, the recently-developed Heat-Vented Truck and Bus Tire, puncture sealing Sealed-Air tubes, and the new thin heels for women. He stated that the company is the largest manufacturer of thin rubber heels in the world. Mr. Seiberling also expressed optimism for the coming year, stating that it looked "most encouraging with respect to increased sales volume."

LEE RUBBER & TIRE INCREASES PROFITS

For the fiscal year ended on October 31, 1938, the Lee Rubber & Tire Corporation reports a net profit of $950,598 after all charges and provision of $234,302 for Federal income tax, including $51,881 surtax on undistributed profits. The result is equivalent to $3.71 each on 255,565 $5-par capital stock shares outstanding. These figures compare with net profit of $596,319, or $2.32 a share on 257,465 shares, in the preceding fiscal year. Net sales for the year amounted to $12,219,048, a decrease of 11% from those reported in the previous year.

The consolidated balance sheet as of October 31, 1938, shows total current assets of $6,534,924, of which $2,111,338 was in cash and $1,282,251 in notes and accounts receivable, against total current liabilities of $1,199,956. At the close of the preceding fiscal year, Lee reported current assets of $5,942,754 and current liabilities of $971,056. The balance sheet indicates an inventory of raw materials and supplies in transit, process and finished goods of $3,250,710, the figure being based at the lower of cost or market.

John J. Watson, president of the company, in commenting on the report, states that the 11% decrease in sales was largely in the mechanical goods division which was affected by the depressed condition of general industry, and that the sales of Lee tires showed an increase over the previous year not only in dollar volume but in units sold. The mechanical division is said to have shown an improvement in volume in the last three months.

U. S. RUBBER REDEEMS SINKING FUND BONDS

The United States Rubber Company took advantage of the option provided in its indenture and redeemed $1,000,000 worth of its 4¼% Sinking Fund bonds on December 31. The unexpected action anticipated by three years the first required due date for any sinking fund redemption of the company's First Mortgage and Collateral Trust Indenture Bonds.

At the same time it was revealed that U. S. Rubber had paid off the $800,000 mortgage which was assumed when it purchased its office building at 1790 Broadway in New York City, and had retired $342,000 in debenture bonds of one of its subsidiaries. With the mailing of $2,604,000 in dividends on the preferred stock on December 23, plus the above payments, U. S. Rubber paid out $4,746,000 in cash during December.

Taking all of these disbursements into consideration, U. S. Rubber estimates its cash balance at the year-end to be approximately $15,000,000. Cash balance on June 30, 1938, when a report for the first six months of the year was issued, amounted to $5,346,214. U. S. Rubber has no bank loans.

The calling of $1,000,000 in the first mortgage bonds reduces the consolidated funded indebtedness of U. S. Rubber and its subsidiaries to $44,950,000, of which amount the company itself holds $950,000 in its own insurance and employee funds. On December 31, 1928, just prior to the appointment of F. B. Davis, Jr., as president and chairman of the board of directors, the company owed in bank loans and long term debt a total of $130,000,000.

FIRESTONE REPORTS PROFIT OF $5,258,041

Firestone Tire & Rubber Company reports a net profit of $5,258,041, or $1.27 a share on 1,936,458 common shares after preferred dividend requirements, for the fiscal year ended on October 31, 1938. This compares with $9,269,177, or $3.33 a common share, in the preceding fiscal year. Net sales for the year amounted to $141,882,681, a decrease of 9½% from those recorded in the previous year.

The consolidated balance sheet as of October 31 shows total current assets of $84,750,403, of which $18,942,956 is in cash and $26,325,103 in customers' notes and accounts receivable, less reserve, against total current liabilities of $9,429,496. This compares with total current assets of $88,332,892 and total current liabilities of $41,800,088 at the end of the previous fiscal year. The sharp decline in current liabilities was due to the payment of $27,500,000 of bank loans.

In a report accompanying the financial statement, John W. Thomas, president of the company, revealed that Firestone has more than doubled its business in recent years. In 1933 net sales for the fiscal year were $75,402,268 and reached $156,823,095 in 1937. To keep pace with this business expansion, Firestone has constructed a modern tire manufacturing plant in Memphis; opened 284 Auto Supply and Service Stores; expanded its rubber plantations in Liberia; built a plant for the manufacture of steel and plastic products in Wyandotte, Michigan; acquired a tire cord fabric mill in Gastonia, North Carolina; built a tire plant in Port Elizabeth, South Africa; and purchased a factory in Fall River, Mass., to manufacture latex products.

Referring to recent Firestone developments, Mr. Thomas made mention of "Airtex," the material made by aerating latex, which is used for mattresses, seat cushions and furniture upholstery in general. He also referred to the new Firestone highway road markers and rubber tie plates for railroad tracks, as well as to several new tires and tubes introduced during the past year. At the conclusion of his report, Mr. Thomas stated that Firestone's prospects for the coming year are most promising, abetted by the introduction of new and diversified products.

New Name for Subsidiary

Effective January 1, all manufacturing and selling activities of the U. S. Industrial Alcohol organization, with the exception of resins, will be conducted by U. S. Industrial Chemicals, Inc., a wholly-owned subsidiary, formerly known as U. S. Industrial Alcohol Sales Co., Inc. The change of name designates more accurately the present nature of the organization's business and reflects its greatly widened scope in the chemical field.

TRADE AGREEMENTS HOLD SIGNIFICANCE

The recent trade agreements consummated by the United States with the United Kingdom and Canada are the first of the reciprocal trade treaties to hold much significance to the domestic rubber industry, according to a special statement made by E. G. Holt, chief of the Leather and Rubber Division of the Bureau of Foreign & Domestic Commerce. This is not surprising since rubber products do not bulk large in our trade with many individual countries, imports of crude rubber constituting the outstanding item in the industry's foreign trade. Nevertheless, concessions on rubber products in the new treaties were of real importance.

Crude rubber has been free of import duty in this country since shortly after the Civil War, and under the treaty with the United Kingdom it is bound free, a similar concession on cotton being made by the British. In effect, each party guarantees not to tax imports of an important commodity produced by the other. Gutta-percha, jelutong and siak, as well as rubber, are bound free by the United States, while sulfur is bound free and carbon black bound at 10% by the United Kingdom.

The United Kingdom, furthermore, agrees "to consult the parties to the International Rubber Regulation Agreement as to the possibility, subject to the main objects of that Agreement as set out in the Preamble thereto not being prejudiced, of amending that Agreement so as to permit the exportation of rubber planting material to countries not party to it." At present such exportation is prohibited.

United States Concessions

Our ad valorem rates of import duty on rubber goods other than tires have been fairly high, Mr. Holt points out, and the new treaties reduce duties on various items rather sharply. On imported golf and tennis balls from England, as well as rubber belting valued at 40 cents or over a pound, the duty declines from 30% to 20%; on golf ball centers, from 25% to 15%; on raincoats over $4.00 in value, from 37½% to 20%; on card clothing (often of rubber-impregnated fabric), from 45% to 35%.

Other reductions in the British treaty include: rubberized blanketing, 40% to 30%; molded cotton and rubber packing, 40% to 30%; waterproof cloth, 30% to 25%; hard rubber goods (except syringes), 35% to 25%; mouthpieces for pipes, and cigar and cigarette holders, from 5 cents each plus 60% to 2½ cents each plus 30%. Lower rates also apply on bicycles imported with or without tires.

In the Canadian agreement, the United States reduces the rate on rubber-lined cotton fire hose from 19½ cents a pound plus 15% to 10 cents a pound plus 7½%; and on rubber hose and tubing of not less than ¾-inch inside diameter from 25% to 12½%. Through our most-favored nation policy, these reductions apply to imports of the listed items from all countries except Germany.

United Kingdom Concessions

Items bound by the United Kingdom include sheets and tubing wholly of rubber (the tubing of a value exceeding 2s. per pound) and piping and tubing of rubber (armored or reinforced) at 10%. Piping or tubing not armored will pay a rate of 15% or 1½d. a pound, whichever is higher, instead of the former 20% or 1½d. a pound. Other reductions include: rubber sheeting with textile backing, 20% instead of 20% or 8d. a pound, whichever was higher; belting valued at more than 54 cents a pound, 10% instead of 15%; and rubber bands and erasers, 15% instead of 20%.

Furthermore, under the British agreement, a great many concessions are listed on the part of the British Colonies. In all but a few cases these are bindings of previous rates or bindings of a definite margin of preference to Empire products, Mr. Holt points out, and thus operate as a safeguard against more difficult trading conditions. For instance, long rubber boots for fishermen are bound free for Newfoundland, while rubber hose is bound at 5% for Northern Rhodesia.

Canadian Concessions

Canadian import duties on rubber goods have also been further revised under the new agreement, our second with that country. The rate of rubber tires for vehicles, fitted or not, is now further reduced from 30% to 25% and on rubber hose, matting, packing and rubber-lined cotton hose, from 30% to 22½%. Further reductions also occur on rubber-coated or impregnated cotton fabrics, on specified rubber compounds in sheets for manufacture of raincoats, and on rubber clothing and rubberized cotton clothing.

Rubber cement and miscellaneous rubber and gutta-percha products not elsewhere provided for in the Canadian tariff schedule, which were reduced from 27½% to 22½% under the previous treaty, are now bound against increase. Reclaimed rubber is bound free in the new agreement. All of the items mentioned here also benefit by escaping in the future, as soon as necessary action is taken by the Canadian Parliament, the bothersome 3% special excise tax on imports, applicable to the duty-paid value in the past. No reexports, however, fall under this exemption.

As Mr. Holt points out in his statement, whether and how much the international interchange of rubber products will be stimulated by the new trade agreements only experience, as reflected in future foreign trade statistics, can determine. In recent years, international trade has been confined even more than formerly to the purchase of goods not locally available, and the international factory interests of leading domestic rubber firms may tend to retard the volume of rubber products moving between the various countries involved.

Taxed for Experiments

The Internal Revenue Bureau recently asked the Board of Tax Appeals to decide whether Charles Edison, Assistant Secretary of the Navy, is entitled to deduct from the 1931 income tax return of his father, Thomas A. Edison, the amounts the late inventor spent with Henry Ford and Harvey Firestone, Sr., on rubber plant experiments. According to the return, $8,645 was deducted under the heading of "experimental expenses." Mr. Edison told the tax board that his father, Henry Ford and Harvey Firestone, Sr., organized the Edison Botanic Research Corporation in 1928 to experiment with extracting rubber from various domestic plants and that his father had advanced $89,926 to the corporation but abandoned his interest in 1931.

FISK ACQUIRES SWEDISH FACTORY

Fisk Rubber Corporation, Chicopee Falls, Mass., together with Swedish interests, has acquired a rubber manufacturing factory at Viskafors, Sweden. A new company, the Fisk Scandinavian Rubber Corporation, has been organized to manufacture tires and mechanical rubber goods in the new plant.

Captain Wilhelm Osterman, former Fisk branch manager and later Swedish distributor of Fisk tires for more than twenty years, is managing director of the new company. J. A. Peterson, connected with the Fisk organization at Chicopee Falls in the engineering division, has been named factory manager. A skeleton organization will also be sent from this country to instruct Swedish workers in Fisk standards.

The Viskafors factory, located near Gothenburg, largest seaport in Sweden, is being equipped with modern tire-making machinery and is expected to be in full operation for the spring selling season. Production will be between 300 and 500 tires and tubes per day. The factory now employs approximately 400, and it is anticipated that there will be 500 workers when the new tire division begins to operate. The buildings cover an area of 107,600 square feet.

Carbon Black in Italy

The firm of Pirelli and Company, Milan, Italy, is reported to be manufacturing carbon black utilizing the German process of mixing naphthalene and anthracene. Italy is a large consumer of carbon black and Pirelli's action is expected to result in a substantial reduction in imports.

Names in the News

G. K. TRIMBLE, chief chemist of the Midwest Rubber Reclaiming Co. for the past ten years, was elected a vice-president of the company at its annual meeting held last month. All other officers were re-elected.

H. E. SIMMONS, president of the University of Akron, and long associated with the activities of the Rubber Division, A. C. S., was signally honored last month when the University's newest engineering building was officially renamed Simmons Hall. The action came as a result of student insistence.

JOHN H. BUNTING has resigned as director of advertising and merchandising for the Seiberling Rubber Co., Akron, to help JOSEPH and HOWARD FUNK, popular Akron aviators, organize the Akron Aircraft Co. The new concern will manufacture the Funk airplane, recently approved and accepted by the Government.

T. W. CASEY, vice-president and sales manager, Seiberling Latex Products Co., Barberton, Ohio, was elected a vice-president of the Toy Manufacturers of the U. S. A., Inc., at a meeting of the manufacturers held in New York City on December 8-9. He was also re-elected as a director.

EUGENE F. HEER, until recently associated with the Detroit plant of the U. S. Rubber Co. as a chemist in the motor products division, has been placed in charge of sales research activities of the Acheson Colloids Corporation, Port Huron, Mich. He will be engaged in developing new uses for the company's "dag" colloidal graphite.

GODFREY L. CABOT, head of the carbon black company bearing his name in Boston, Mass., has provided the Columbia University Pultizer Graduate School of Journalism with funds for the establishment of two to five annual prizes in journalism. The prizes are aimed at building up sympathetic understanding among the peoples of South, Central and North America.

HARRY E. THOMPSON, electrical engineer in charge of rubber insulation development and research at the Pawtucket (R. I.) plant of the Anaconda Wire & Cable Co., has been transferred to the engineering headquarters of the company at Hastings-on-Hudson, New York. His new connection broadens the scope of his duties and responsibilities with Anaconda.

JOHN REHNER, JR., associated with the Malayan Research Laboratories of the B. F. Goodrich Co., at Kuala Lumpur, F. M. S., for the past few years, has been transferred to the Goodrich laboratories at Akron.

EMMET SHEAHAN has been named general manager of the new Automotive Division of the U. S. Rubber Co. The new division, with headquarters at Detroit, includes all the products developed and sold by the company in its various factories for use in the manufacture of cars. MR. SHEAHAN also continues as operations manager of U. S. Rubber's Detroit and Indianapolis plants.

VICTOR E. WILLIAMS, manager, New York sales branch, Monsanto Chemical Co., has been promoted to assistant general manager of sales for the company. He will divide his time between New York City and Monsanto's headquarters in St. Louis. A. T. LOEFFLER, who has been assistant manager of the New York branch, has been advanced to the managership.

JOHN D. CAMPBELL, associated with the Akron factories of the B. F. Goodrich Company for many years, has been appointed superintendent of the company's division in Sweden. He sailed from New York last month to assume his new duties.

MORRIS C. SWOPE, formerly connected with the Alex. C. Ferguson Co., of Philadelphia, has joined Montgomery Bros., manufacturers of rubber cements, also of Philadelphia, as sales manager.

WILLIAM F. TULEY, formerly in charge of research and sales service work on rubber chemicals for Naugatuck Chemical at Naugatuck, Conn., is now located in the New York offices of the U. S. Rubber division as assistant to ELMER ROBERTS, vice-president of the company and general manager of Naugatuck Chemical.

DR. SAMUEL COLVILLE LIND, dean of the Institute of Technology of the University of Minnesota, has been elected president of the American Chemical Society for 1940. He takes office as president-elect this month. PROF. CHARLES A. KRAUS, of Brown University, is president for the 1939 term.

NILS FLORMAN, JR., has been named Eastern representative for the Adamson Machine Company and the R. H. Freitag Company, both of Akron, Ohio, for their respective lines of machinery and molds. His headquarters are at 629 West 50th Street, New York City.

A. F. CLARK, of the Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, discussed "Synthetic Rubber' before a meeting of the Purchasing Agents' Association of Eastern New York held in Schenectady, N. Y., on December 15.

NEWHALL NAMED TO HIGH GOODRICH POST

Arthur B. Newhall, president of the Hood Rubber Company, Watertown, Mass., a wholly-owned Goodrich subsidiary, who was elected a vice-president and a member of the board of directors of the B. F. Goodrich Com-

pany last October, was elected executive vice-president in full charge of all production and sales of the parent company, at a special meeting of the Goodrich directorate held last month. He was also appointed a member of the company's executive committee.

Born in Lynn, Mass., in 1884, Mr. Newhall was graduated from Tufts College where he specialized in mechanical engineering. His first job was as a director of mechanical arts and drawing at Lynn High School, and later he taught the same subjects at Wentworth Institute in Boston. In 1917 he entered the purchasing department of Hood Rubber and became successively purchasing agent, office manager, merchandise manager, branch auditor, tire department manager, general manager and was executive vice-president when the company was acquired by Goodrich in 1929.

Mr. Newhall is a director of the Second National Bank of Boston, the Sanborn Instrument Co., Cambridge, and the Rubber Manufacturers Association. He is a trustee of Tufts College and of the Belmont Savings Bank, Belmont, Mass., as well as a director and member of the executive committee of the Associated Industries of Massachusetts. In addition, Mr. Newhall is president and chairman of the investment committee of the Arrow Mutual Liability Insurance Company of Watertown.

REUBEN A. LEWIS, JR., executive vice-president of the Metropolitan Trust Company of Chicago, has been elected a director of the Baldwin Rubber Co.

Obituaries

James E. Grosjean

James E. Grosjean, founder of the Lima Cord Sole & Heel Corporation, Lima, Ohio, and chairman of the board of directors, died in Memorial Hospital, Lima, on November 29, at the age of 77, as a result of pneumonia followed by a heart attack. Born in Ohio, of Swiss-French parentage, Mr. Grosjean spent practically his entire life in the state. Before he engaged in the manufacture of soles and heels, he was active in the retail shoe business in Lima, specializing in corrective footwear, having been one of the earliest users of metal arch supports of his own design.

In 1920, Mr. Grosjean organized the forerunner of the present Lima Cord Sole & Heel Co. A piece of an automobile tire fastened to the bottom of a badly worn shoe is said to have given him the idea for the special cord-on-end soles and heels now being produced by the company. He served as president of the company until 1937 when he relinquished the active management and accepted the chairmanship of the board of directors, in which capacity he served until his death.

Mr. Grosjean enjoyed a vast and extremely close friendship and business relationship among the shoe manufacturing fraternity in both the United States and foreign countries, having personally introduced the Gro-Cord Sole from its inception. Always of an inventive nature, he at one time portrayed mechanically the stories of "Noah's Ark" and "Cock Robin" in one of his retail establishments. One of these devices, together with an elaborate collection of relics, is now on display in a Lima museum.

Funeral services were held on December 2. Burial was in the Maire-Grosjean receiving vault in Woodlawn Cemetery, Lima. He leaves a widow and a daughter.

John E. Thropp

John Exton Thropp, president of the William R. Thropp & Sons Company, manufacturers of rubber and other machinery, died at his home, 940 West State Street, Trenton, N. J., on December 17, following a long illness. He was 56 years of age. Born in Trenton, Mr. Thropp attended the public schools and the State Model School, after which he took a general mechanical engineering course at Drexel Institute, graduating in 1900. Shortly thereafter he entered the services of the Thropp machinery firm.

In addition to heading the machinery company, Mr. Thropp was also president of the Anchor Warehouse Co., and vice-president of both the Broad Street National Bank and the Greenwood Cemetery Association, all of Trenton. Active in Masonic circles, he was a member of Trenton Lodge, No. 5, F. & A. M.; Three Times Three Chapter, Royal Arch Masons; Palestine Commandery, No. 4, Knights Templar; and Crescent Temple. He leaves a widow, son and daughter.

Elmer H. Hartle

Elmer H. Hartle, general manager of the Chemical Rubber Company, Cleveland, Ohio, publishers of technical rubber and other books and suppliers of laboratory apparatus to the rubber and other fields, died at his home in Lakewood, Ohio, on December 30. Death was due to a cerebral hemorrhage. Born in Hardin County, Ohio, Mr. Hartle attended Miami University and specialized in industrial chemistry after being graduated. He was a member of Phi Delta Theta and of several chemical societies. He leaves a widow, son and two daughters.

Clyde McCartney

Clyde McCartney, superintendent of the Surety Rubber Co., Carrollton, Ohio, manufacturers of gloves, aprons, finger cots and other rubber products, died suddenly at his home in Carrollton on December 9 from a heart attack. He was 65 years of age. Mr. McCartney joined Surety on its organization in 1928 and was named superintendent in 1932. He leaves four daughters.

Postpone Martin Hearing

The hearing scheduled before Judge Bondy in New York City on December 16, 1938, on a reorganization plan for the Martin Custom Made Tires Corporation has been postponed until February 14, 1939. Sid Pike, of T. A. Desmond & Co., Inc., chairman of the Creditors Committee, advised the court that conferences were still being held with the officers and counsel for the corporation, as well as other interested parties, and as a result of these conferences it is believed that an effective plan will be evolved in the early future. Judge Bondy therefore postponed the hearing to afford sufficient time for the preparation and filing of a suitable plan.

Akron Meets January 20

The Akron Group, Rubber Division, A.C.S., will hold its next meeting at the Akron City Club on January 20. William Welch, president, Midwest Rubber Reclaiming Company, will present the motion picture "Rubber Reborn", which traces the manufacture of reclaimed rubber from start to finish. As an additional feature, Dietrich Rempel, of the Sun Rubber Company, will tell of his personal experiences during the Russian Revolution.

Goodyear Files New Mortgage

The new financing plan of the Goodyear Tire & Rubber Co., Akron, calculated to save the company more than $1,000,000 a year interest charges, went into effect on January 3 following filing of a $40,000,000 mortgage against the company's properties. The mortgage has sufficient collateral so that it may be extended to $60,000,000 if Goodyear later wishes to add to its financing structure, according to company officials. With the funds received, Goodyear retires 5% obligations and assumes new ones bearing only 3½% interest.

Larabee Joins Firestone

Byron H. Larabee, executive secretary of the Greater Akron Association, has resigned from that organization and has joined the legal staff of the Firestone Tire & Rubber Co. In his new post, he will be associated with the company's law staff in its foreign affairs division, and his duties have already taken him to Liberia where work in connection with Firestone's plantations will keep him occupied for the next several months. Mr. Larabee once served as assistant law director of Akron.

NEW ENGLAND

Holders of common stock of Fisk Rubber Corporation, Chicopee Falls, Mass., have received their first dividend since the corporation was formed in the reorganization of Fisk Rubber Company five years ago. The dividend, 50 cents a share, was paid on December 20 on a vote of the directors, who also declared the usual quarterly dividend of $1.50 per share on preferred stock. The preferred dividend has been paid ever since the reorganization.

The common stock dividend reflects the favorable business which Fisk experienced during 1938. The corporation is concerned mainly with manufacturing automobile tires for the replacement field.

One man was killed and two others injured on December 12 in a chemical explosion which damaged part of the Stamford, Conn., research laboratory building of American Cyanamid Company. About 90 windows were blown out and holes torn in a brick corridor wall. In Malden, Mass., December 1, one man was killed and another injured by an explosion which demolished a machine shop of the N. W. Mathey Co., rubber cement manufacturers, at 67 Maplewood Avenue. The damage was estimated at $40,000.

Norwalk Tire & Rubber Company, Norwalk, Conn., is building a frame addition to its factory on Belden Hill Avenue, to be 24 x 51 feet, and to cost about $1,500.

Los Angeles News

The importance of Los Angeles as the second largest tire manufacturing center in America was emphasized last month by the announcement of the B. F. Goodrich Company that it had completed its ten-millionth tire in the Los Angeles Plant. J. C. Herbert, general manager of the plant; F. E. Titus, general sales manager of the Pacific Division; Fred A. Nied, general plant superintendent; and J. E. Wacksmuth, Los Angeles district manager, were present at ceremonies attending the production of the ten-millionth tire. The Los Angeles plant, which is currently operating on full schedule, was opened in May, 1928, and has already absorbed more than 80,000 tons of crude rubber in the production of tires.

Klingtite Products Company, manufacturers of latex-base adhesives, with factory at 4669 Hollywood Boulevard, has been reorganized, with Dr. C. S. Leaf McManus as president. An intensive sales campaign will shortly be inaugurated and at least one new product, an adhesive for use with transparent cellulose acetate, will be introduced. The company markets its products largely through chain and department stores on the Pacific Coast.

U. S. Rubber Company has completed an addition to its warehouse at the plant on Telegraph Road. F. S. Carpenter, plant manager, states that prospects for 1939 are particularly encouraging, and that the plant is now running on full schedule.

The Stauffer Chemical Company has completed the installation of the first major sulfur grinding plant in the Los Angeles area. It is located at 3200 East 26th Street. The plant occupies a modern reinforced concrete building which has been enlarged by the company. The new grinding plant will serve the rubber and other industries throughout the southern half of California, an area formerly served by the company's plant in San Francisco. The capacity of the new plant is said to be 85 tons per 8-hour day. H. L. Herkebrath is plant superintendent. Sales of the company's products will continue to be handled by the San Francisco Sulphur Company.

Rubbercraft Corporation of California entertained hundreds of its friends and customers at an open house Christmas Party held on December 24, at which Charles M. Merralls, president, acted as host. A buffet lunch was served to all guests at the downtown offices and sales rooms.

G. G. Balazs, former chief chemist at the Goodyear plant in Los Angeles, sailed from New York on January 4 for England where he will act in a similar capacity at the company's plant at Wolverhampton. He expects to remain in England about seven years.

A golf tournament for members of the Los Angeles Group, Rubber Division, A. C. S., was scheduled to be held at the Flintridge Country Club on January 14. Lunch was to have followed the play at which prizes were to have been awarded.

The next meeting of the Los Angeles Group, Rubber Division, A. C. S., will be held on Tuesday, February 7, at the Mayfair Hotel. The new chairman, Garvin Drew, of A. Schrader's Son, will preside at the meeting and an instructive and entertaining program is being arranged. The January meeting was omitted because the date was too close to the New Year's holidays.

W. J. Voit Rubber Corporation occupied its new building on January 1. The building, constructed as an addition to the plant on Nevin Avenue, was recently completed. The company manufactures rubber balls and beach equipment, among other rubber products.

A diving suit worn by Morris Gardaner, world famous deep-sea diver, formerly connected with the United States navy, is attracting attention because of a new method of patching used. The patching was done with a latex adhesive product, the patch itself consisting merely of ordinary canvas. The new process is said not only to reduce the cost of repairing a diving suit but also to be a time saver. Gardaner, with this equipment, went down into the waters at Wilmington near Long Beach where acid and oil from oil fields near-by make the water especially destructive to diving suits.

Correction

In referring to the settlement of litigation involving the Overman Cushion Tire Company and the Goodyear Tire & Rubber Company in these columns last month, reference was made in the article that "Overman is currently in the midst of reorganization proceedings under Section 77B of the Bankruptcy Act." The reference was, of course, in error since the assets of the Overman Cushion Tire Company were sold in Bankruptcy Court on January 14, 1938, to Mr. A. Kreger, the present sole owner and principal. Since January 14, 1938, the new company, the Overman Tire Company, Inc., has been operating as a new organization with no connection whatsoever with the principals of the bankrupt company, but has been producing the same quality tire that has borne the Overman name for approximately fifty years.

Garvin Drew

Chairman of Los Angeles Rubber Group

Tribute Paid to Firestone

Fitting tribute was paid to the memory of the late Harvey S. Firestone at a memorial banquet and annual meeting of the Akron Chamber of Commerce held on December 20. More than 500 business leaders heard Charles E. Edison, assistant secretary of the navy and son of the late Thomas E. Edison, extol the memory of the founder of the Firestone Tire & Rubber Co. Other speakers included F. A. Seiberling, Mayor Schroy of Akron, Congressman Harter and Governor Davey of Ohio (since replaced by Governor Bricker). Formal dedication of the huge South Akron grade crossing elimination bridge, which Mr. Firestone had visioned many years ago and which has been officially termed the Harvey Samuel Firestone Memorial Bridge, was made earlier in the same day. New type rubber traffic control markers, latest products of Firestone's development department, called "Line-O-Lites," are used on the bridge.

Issue Chemical Index

The Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Wilmington, Delaware, has issued a special index to its rubber chemicals literature. This index, issued as Report No. 38-11, may be secured without charge by addressing requests to the Rubber Chemicals Division of the company. A reprint of the paper by Ira Williams on "The Distribution of Combined Sulfur in Vulcanized Rubber and Its Bearing on the Sulfide Linkage Theory of Vulcanization," delivered at the Rubber Technology Conference in London last May, has also been made available.

MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, JANUARY 10, 1939

Crude Rubber

STARTING with a price for spot on the Exchange of 16.06 on December 12, the price for crude rubber climbed steadily until it reached 16.65 on December 27, high for the period. Announcement by the Rubber Manufacturers Association that November consumption totalled 46,048 tons, an increase of 14.2% over October, lifting of hedges, new commission house buying, revelation that tire inventories during November dropped to the lowest level of the year, and renewed factory purchasing all contributed to the advancing price. After December 27, however, the price started to toboggan, dropping to 16.10 today (January 10), which is practically the same price quoted one month ago. The easiness of sterling and the lack of consistent market interest were the major factors behind the declining price. There has been more interest in futures than in actuals in the past few days. Quotations in the outside market, Exchange, London and Singapore, follow:

As of January 10

Plantations—

Ribbed Smoked Sheets—			
No. 1 Spot	—	@	.16
January-March	—	@	.16⅛
April-June	—	@	.16⅜
No. 2	—	@	.15⅞
No. 3	—	@	.15⅝
No. 4	—	@	.15⅜
Thin Latex Crepe	—	@	.17⅜
Thick Latex Crepe	—	@	.18⅜
Brown Crepe, No. 1	—	@	.15⅝
Brown Crepe, No. 2	—	@	.15¼
Amber Crepe, No. 2	—	@	.15⅝
Amber Crepe, No. 3	—	@	.15⅜
Brown Crepe, Rolled	—	@	.14⅞

Latex—

Normal, per lb., carload lots	—	@	.19⅛

Paras—

Up-River, fine	—	@	.14⅛
Acre Bolivian, fine	—	@	.14¼

Balata—

Surinam sheet	—	@	.38

LONDON MARKET

Standard Smoked Sheets—Buyers—January 10

April-June	8 5/16	@	8 1/4d
July-September	8 1/8	@	8 3/8d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—January 10

April-June	—	@	7 29/32d
July-September	—	@	7 31/32d

Reclaimed Rubber

Reclaimers report a fair amount of business with sustained interest from rubber manufacturers. Consumption of reclaim for November was estimated at 12,668 tons, a gain of 7.3% over the 11,803 reported consumed during October. November consumption was the highest since September, 1937, when the total was 13,681 tons. There has been no change in the price structure since our last report.

Shoe

Unwashed	lb.	.06½	@	.06¾
Washed	lb.	.10	@	.10¼

Tube

No. 1 (Floating)	lb.	.12	@	.12¼
No. 2 (Compounded)	lb.	.08	@	.08¾
Red tube	lb.	.08	@	.08¼

Tires

Black (acid process)	lb.	.07	@	.07¼
Black, selected tires	lb.	.06	@	.06¼
Dark Gray	lb.	.09¼	@	.09¾
White	lb.	.11½	@	.12
Truck, Heavy Gravity	lb.	.05½	@	.06
Truck, Light Gravity	lb.	.07	@	.07½

Miscellaneous

Mechanical blends	lb.	.04½	@	.05

Scrap Rubber

(Delivered Akron Mills)

The scrap rubber market has been fairly active in the past several weeks and dealers look for a continuation of activity for some time to come. Prices have dropped slightly on auto tire peelings and boots and shoes since our last report. Current quotations follow:

(Prices to Consumers)

Auto tire peelings	ton 15.00	@	17.00
Mixed auto	ton 11.00	@	12.50
Beadless tires	ton 14.50	@	16.00
Clean solid truck tires	ton 20.00	@	22.50
Boots and shoes	ton 17.50	@	19.00
Arctics, untrimmed	ton 13.00	@	15.00
Inner tubes, No. 1	lb. .07	@	.08
Inner tubes, No. 2	lb. .03½	@	.03¾
Inner tubes, Red	lb. .03⅝	@	.03¾

Cotton

Cotton prices have swung in a 36 point range since our last report, low for the period being 8.58, quoted on December 13, and high 8.94, on January 3. From a price of 8.66 on December 12, middling uplands dropped to 8.58 the following day due to heavy long liquidation which followed the issuance of delivery notices for 1,400 bales in New York. Report of consumption of all cotton in domestic mills in the United States during November, made on December 14, served to bring the price up to 8.65. For the balance of December the price climbed slowly but steadily, with few interruptions, trading being dull for the most part. Based on better trade demand and scarcity of offerings at the year-end, the price jumped from 8.83 on December 30 to 8.94 on January 3, but uncertainty as to Federal plans for 1939 crop control and for disposal of the loan surplus has resulted in a declining price in the past few days. Quotations for middling uplands on the Exchange follow:

	Dec. 10	January 11		
	Close	High	Low	Close
March	8.23	8.34	8.25	8.28
July	7.76	7.84	7.73	7.78
October	...	7.36	7.26	7.30

Tire Fabrics

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb. .27	@	.27¼
Peeler, carded, 23/4/3	lb. .28	@	.28¼
Peeler, carded, 15/3/3	lb. .25	@	.25¼
Peeler, carded, 13/3/3	lb. .24	@	.24¼
Egyptian, carded, 23/5/3	lb. .40½	@	.40¾
Egyptian, combed, 23/5/3	lb. .45½	@	.45¾
CHAFERS			
Carded, American, 1 1/16"	lb. .27	@	.27½
Carded, American, 1"	lb. .18	@	.23

Sheetings

48x40	36 in.	5.50	lb.	— @	.03½
40x40	36 in.	6.15	lb.	— @	.03⅝
40x36	36 in.	6.50	lb.	— @	.03
48x48	40 in.	7.50	lb.	— @	.06⅞
48x48	40 in.	2.85	lb.	— @	.06
56x60	40 in.	3.60	lb.	— @	.05⅝
48x44	40 in.	3.75	lb.	— @	.04⅞
44x40	40 in.	4.25	lb.	— @	.04⅝

Ducks

Enameling (single filling)	lb.	.21	@	.23
Belting and Hose	lb.	.25	@	—
Single filling, A grade	lb.	.09½	@	.12½
Double filling	lb.	.10½	@	.13½

Closing Rubber Prices on New York Commodity Exchange, Inc.

No. 1 Standard Contract of 10 tons

FROM DECEMBER 11 TO JANUARY 10

Date	Spot	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Sales
Dec. 11															
12	16.06	16.08	16.02	16.02	16.00	16.02	15.99	15.99	16.00	16.00	16.01	16.02	16.02		119
13	16.06	16.09	16.00	16.00	15.96	15.97	15.95	15.95	15.96	15.96	15.95	15.93	16.00		98
14	16.24	16.30	16.21	16.21	16.21	16.21	16.19	16.20	16.21	16.22	16.21	16.23	16.23		483
15	16.10	16.21	16.09	16.09	16.07	16.02	15.96	15.99	16.00	16.01	16.02	15.94	15.97		341
16	16.11	16.15	16.13	16.12	16.11	16.11	16.09	16.09	16.10	16.08	16.08	16.10	16.10		166
17	16.25	16.27	16.23	16.19	16.15	16.12	16.09	16.09	16.10	16.10	16.11	16.08	16.08		29
18															
19	16.33	16.42	16.34	16.34	16.33	16.33	16.30	16.30	16.28	16.29	16.30	16.30	16.30		301
20	16.25	16.28	16.18	16.18	16.18	16.18	16.17	16.17	16.18	16.17	16.17	16.18	16.18		79
21	16.25	16.29	16.22	16.20	16.18	16.17	16.15	16.15	16.15	16.15	16.16	16.16	16.16		74
22	16.30	16.32	16.25	16.24	16.23	16.22	16.20	16.20	16.21	16.21	16.22	16.22	16.22		68
23	16.45	16.59	16.41	16.44	16.47	16.44	16.41	16.42	16.43	16.44	16.46	16.47	16.47		271
24															
25															
26															
27	16.65	16.71	16.52	16.55	16.58	16.54	16.48	16.48	16.51	16.50	16.49	16.55	16.60		153
28	16.45	——	16.38	16.45	16.53	16.47	16.40	16.40	16.40	16.40	16.40	16.40	16.40		86
29	16.35	——	16.32	16.38	16.44	16.37	16.30	16.29	16.28	16.29	16.30	16.32	16.32		173
30	16.35	——	16.33	16.38	16.43	16.39	16.35	16.35	16.38	16.38	16.35	16.31	16.32		115
31	16.38	——	16.30	16.36	16.40	16.35	16.28	16.28	16.27	16.27	16.29	16.29	16.29		72
Jan. 1															
2															
3	16.30	——	16.20	16.25	16.30	16.29	16.28	16.28	16.28	16.27	16.27	16.27	16.27	16.27	35
4	16.33	——	16.25	16.30	16.35	16.33	16.30	16.31	16.32	16.31	16.30	16.33	16.33	16.33	115
5	16.28	——	16.18	16.23	16.28	16.22	16.15	16.16	16.16	16.16	16.16	16.16	16.18	16.20	80
6	16.17	——	16.12	16.15	16.17	16.15	16.13	16.13	16.14	16.16	16.16	16.15	16.15	16.16	167
7	16.12	——	16.01	16.06	16.12	16.13	16.14	16.13	16.12	16.15	16.17	16.11	16.11	16.12	46
8															
9	16.12	——	16.07	16.09	16.11	16.11	16.11	16.11	16.10	16.12	16.14	16.11	16.12	16.14	94
10	16.10	——	16.04	16.07	16.11	16.11	16.11	16.12	16.12	16.12	16.12	16.16	16.16	16.15	101

New York
January 11, 1939

Rubber CHEMICAL Markets

All Quotations F.O.B. Works Unless Noted

ACCELERATORS

Organic			
A-1 (Thiocarbanilid)	lb.	.26 @	—
A-5-10	lb.	.35 @	.40
A-11	lb.	.52 @	.65
A-19	lb.	.52 @	.65
A-32	lb.	.70 @	.80
A-77	lb.	.42 @	.55
A-100	lb.	.42 @	.55
A-433	lb.	.45 @	.55
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.	.55 @	.70
Butyl Zimate	lb.	3.00 @	—
Captax	lb.	.50 @	.60
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.44 @	.46
Diphenylguanidine	lb.	.35 @	.36
El-Sixty	lb.	.57 @	—
Ethyl Zimate	lb.	3.00 @	—
Ethylidene aniline	lb.	.42 @	.43
Formaldehyde aniline	lb.	.37½ @	.42
Guantal	lb.	.45 @	—
Heptene	lb.	.35 @	.40
Hexamethylenetetramine	lb.	.36 @	—
Lead Oleate, No. 999	lb.	.14 @	—
Witco		.15 @	—
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.36 @	.37
Monex	lb.	— @	2.65
Oxynone	lb.	.64 @	.80
Phenex	lb.	.50 @	.55
Pip-Pip	lb.	2.50 @	—
Pipsolene	lb.	1.55 @	1.85
R & H 40	lb.	.40 @	.41
R & H 50-D	lb.	.42 @	.43
R-2	lb.	1.40 @	1.80
R-23	lb.	.40 @	—
Rotax	lb.	.60 @	.65
Safex	lb.	1.25 @	1.30
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.	.50 @	—
No. 2	lb.	.18 @	.20
Thiocarbanilid, drums	lb.	.24 @	—
Trimene	lb.	.55 @	.65
base	lb.	1.05 @	1.20
Triphenylguanidine	lb.	.45 @	—
Tuads	lb.	2.65 @	—
Ureka	lb.	.60 @	.75
Ureka Blend B	lb.	.60 @	.75
Ureka C	lb.	.56 @	.65
Vulcanex	lb.	.42 @	.43
Vulcone	lb.		
Vulcanol	lb.	.85 @	—
Z-88-P	lb.	.51 @	—
Zimate	lb.	2.65 @	—
Inorganic			
Litharge, domestic	lb.	.07 @	.07½
Magnesia, calcined, heavy	lb.	.04 @	—

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.36 @	.37
Ultramarine	lb.	.15 @	—
Browns			
Mapico	lb.	.13 @	—
Umber, Turkey	lb	.04 @	.04½
Greens			
Chrome	lb.	.21 @	—
Chromium Oxide, bbl.	lb.	.21 @	—
Guignet's Green	lb.	.70 @	—
Reds			
Antimony crimson, 15/17	lb.	.45 @	—
sulfur, free	lb.	.48 @	.60
Indian English	lb.	.09 @	.10
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.09¼ @	—
Whites			
Cryptone, No. 19	lb.	.05⅝ @	.06⅛
Cryptone CB, No. 21	lb.	.05⅝ @	.06⅛
Cryptone, ZS-20	lb.	.08⅜ @	.08⅝
Cryptone, ZS-86	lb.	.08⅜ @	.08⅝
Lithopone Albalith, black label—11	lb.	.04⅛ @	.04⅜
Azolith	lb.	.04⅜ @	.04⅝
Ray-bar	lb.	.05⅞ @	.06⅜
Ray-cal	lb.	.05⅞ @	.06⅜
Rayox	lb.	.16 @	.19
Titanox A	lb.	.14 @	.17
Titanox B	lb.	.05⅝ @	.06⅝
Titanox C	lb.	.05⅝ @	.06⅝
Zinc Oxide—American Process			
American Azo: ZZZ (lead free)	lb.	.06¼ @	.06½
Anaconda, lead free	lb.	.06¼ @	.06½
Horsehead Lead Free Brand: Special—3	lb.	.06¼ @	.06½
XX Red—4	lb.	.06¼ @	.06½
XX Red—72	lb.	.06¼ @	.06½
XX Red—78	lb.	.06¼ @	.06½
XX Red—103	lb.	.06¼ @	.06½
Kadox, black label—15	lb.	.06½ @	.06¾
Blue label—16	lb.	.06½ @	.06¾
Red label—17	lb.	.06½ @	.06¾
St. Joe, black label	lb.	.06¼ @	.06½
green label	lb.	.06¼ @	.06½
red label	lb.	.06¼ @	.06½
U. S. P—7, bbls.	lb.	.09½ @	.09¾
Zinc Oxide—French Process			
Florence White seal—7 bbls.	lb.	.08¾ @	.08¾
Green seal—8	lb.	.08 @	.08¼
Red seal—9	lb.	.07½ @	.07¾
Yellows			
Cadmolith	lb.	.50 @	.55
Chrome	lb.	.14½ @	.15½
Mapico	lb.	.09½ @	—

BLACKS

Arrow "Aerfloted" Specification	lb.	.0275 @	.0625
Bone, powdered	lb.	.05½ @	.14
Carbon, compressed	lb.	.0275 @	.0625
uncompressed	lb.	.0275 @	.0625
"Certified"	lb.	— @	—
"Spherons"	lb.	— @	—
"Disperso"	lb.	.0275 @	.0625
"Excello," compressed	lb.	.0275 @	.0625
"Fumonex"	lb.	.0275 @	.0625
"Gastex"	lb.	.0275 @	.0625
Lampblack	lb.	.07 @	.12
"Micronex"	lb.	.0275 @	.0625
"Supreme"	lb.	.0275 @	.0625
Thermatomic—"P 33"	lb.	.04¾ @	.07¾
"Thermax"	lb.	.01¾ @	.05
United "Dixie" & "Kosmos"	lb.	.0275 @	.0625

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½ @	.12
Asbestine	ton	13.00 @	15.00
Barium carbonate (98-100%)	ton	— @	—
Barium Dust	lb.	.05 @	.06
Barytes	ton	23.65 @	31.15
Basofor	lb.	.04½ @	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	60.00 @	65.00
Calcene	ton	37.50 @	45.00
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	45.40 @	60.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	7.50 @	15.00
Aerfloted, Suprex	ton	9.50 @	21.00
Congaree	ton	9.50 @	—
Crown (f.o.b. plant)	ton	9.50 @	—
Dixie	ton	11.00 @	30.00
Dixie, Jr.	ton	9.50 @	29.00
McNamee	ton	9.50 @	22.00
Par	ton	9.50 @	22.00
Witco	ton	9.50 @	—
Cotton Flock	lb.	.11 @	.15
Glues, extra white	lb.	.28 @	.30
medium white	lb.	.14 @	19
Kalite No. 1	ton	24.00 @	50.00
Kalite No. 3	ton	34.00 @	60.00
"Lime Crest" Industrial Filler No. 100	lb.	— @	—
Magnesium carbonate	lb.	.07½ @	—
Mica	ton	35.00 @	44.00
Pyrax A	ton	7.50 @	20.00
Rottenstone (powdered)	lb.	.02½ @	.05
Soapstone, powdered	ton	16.00 @	22.00
Starch, powdered	cwt.	2.90 @	4.10
Talc, domestic	ton	17.00 @	20.00
Whiting, commercial	ton	17.00 @	18.00
Columbia Filler	ton	9.00 @	14.00
English Cliffstone	ton	33.00 @	43.00
Witco	ton	6.00 @	—
Wood Flour	ton	20.00 @	25.00
Zinc Carbonate	lb.	— @	.10¾
Zinc Stearate	lb.	.23 @	—

MINERAL RUBBER

285°-300° Mineral Rubber	ton	22.00 @	42.00
Black Diamond	ton	27.00 @	—
Genasco, solid (factory)	ton	25.00 @	27.00
Hard Hydrocarbon	ton	22.00 @	42.00
Parmr, solid	ton	25.00 @	—
Pioneer, MR, solid	ton		
Pioneer-granulated	ton		

MISCELLANEOUS

Aromatics—Rodo #0	lb.	3.50 @	4.00
Rodo #10	lb.	4.50 @	5.00
Curodex 19	lb.	2.75 @	—
Curodex 188	lb.	3.50 @	—
Curodex 198	lb.	4.50 @	—
Para-Dors No. 5145	lb.	2.00 @	—
Aresklene No. 375 (dispersing, wetting and penetrating agent)	lb.	.40 @	—
Darvan (dispersing agent)	lb.	.30 @	.50
Santomerse (dispensing, wetting, penetrating and stabilizing agent)	lb.	.13 @	—
Sunproof	lb.	.23 @	.25
Sponge Paste	lb.	— @	.80
Tackol (tackifier)	lb.	.115 @	—
Tonox	lb.	.52 @	.61

SOFTENERS

Acids			
Acetic, 28%, bbls.	100 lb.	2.53 @	2.78
Nitric, 36 degrees	cwt.	5.00 @	6.00
Sulfuric, 66 degrees	ton	15.50 @	16.50
Acids, Fatty			
Laurex	lb.	.12 @	.14
Stearex Beads	lb.	.08 @	.09
Stearic, double pressed	lb.	.12½ @	.13½
Stearite	lb.	.10½ @	.11¾
Alkalies			
Caustic Soda, 76%	cwt.	3.15 @	3.80
Soda Ash, 58%, C.L.	cwt.	— @	2.35
Oils			
Cycline Oil	gal.	.20 @	—
Degras, bbls.	lb.	.07¾ @	.08
Fluxrite	lb.	.05½ @	.06½
Palm Niger	lb.	.05½ @	.06½
Para-Flux	gal.	.17 @	—
Petrolatum, light	lb.	.03½ @	.03¾
Pigmentaroil, tank cars	gal.	.16 @	—
in drums	gal.	.22½ @	.23½
Pine, steam distilled	gal.	.64 @	.69
dest. dist., drums	gal.	.49 @	.50
Rosin Oil, cmpd	gal.	.40 @	—
Rubberol, f.o.b. Chicago	lb.	.13½ @	.14
Rubtack	lb.	.08 @	.10
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	.07 @	—
Witco Softener No. 20	gal.	.20 @	—
Wooum No. 8, c.l.	lb.	.06 @	—
Wobonite, c.l.	lb.	.05 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.05½ @	.06½
coal tar	ton	19.00 @	22.00
hardwood	ton	16.00 @	22.50
pine, 200 lb. gr. wt.	bbl.	6.00 @	6.50
Pigmentar, tank cars	gal.	.16 @	—
in drums	gal.	.22½ @	.23½
R. S. L. Resin	lb.	— @	—
Retort Pine Tar, drums	ton	20.00 @	26.00
Solvents			
Acetone, pure	lb.	— @	.06¼
Alcohol, denatured, methanol, No. 1 bbls.	gal.	.33 @	.39
Benzene, 90%	gal.	.18 @	.23
Beta-Trichlorethane	gal.	— @	.20
Bondogen	lb.	.98 @	1.65
Carbon, bisulfide	lb.	.05¼ @	.08
Carbon tetrachloride	lb.	.05½ @	.08
Dichlorethylene	lb.	— @	.25
Dipentene, cml., drums	gal.	.41 @	.50
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Ethylene dichloride	lb.	.05½ @	.06½
Plastogen	lb.	.07¾ @	.12½
Reogen (drums)	lb.	.11½ @	.20
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Trichlorethylene	lb.	— @	.09½
Turpentine, spirits	gal.	.43 @	.47
dest. dist., drums	gal.	.33 @	.41
Waxes			
Beeswax, white	lb.	.39 @	.45
Carnauba, yellow	lb.	.46 @	.47½
Ceresin, white, dom.	lb.	.08 @	.11
Montan, crude	lb.	.10¼ @	.11¾
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02¾ @	—
White crude scale 124/126	lb.	.02¾ @	.03
Refined, 122/127	lb.	.04½ @	—

ANTI-OXIDANTS

Agerite Alba	lb.	1.50 @	2.10
Exel	lb.	1.00 @	1.40
Gel	lb.	.57 @	.77
Hipar	lb.	.65 @	.92
Powder	lb.	.52 @	.73
Resin	lb.	.52 @	.73
Resin D	lb.	.52 @	.73
White	lb.	1.25 @	1.75
Albasan	lb.	.70 @	.75
Antox	lb.	.56 @	.58
B-L-E	lb.	.52 @	.61
Flectol H	lb.	.54 @	—
Flectol White	lb.	1.00 @	—
Flectol B	lb.	.54 @	—
Neozone	lb.	.63 @	—
Oxynone	lb.	.68 @	—
Perflectol	lb.	.67 @	.75
Retardex	lb.	.35 @	.40
Santoflex A	lb.	— @	—
Santoflex B	lb.	.54 @	—
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.52 @	.61

MOLD LUBRICANTS

Aresklene	lb.	— @	—
Cocoa Soapstock	lb.	.06 @	.08
Dipex	lb.	.06 @	.08
Lubrex	lb.	.25 @	.30
Mold Paste	lb.	.18 @	—
Rubberol, f.o.b. Chicago	lb.	.13½ @	.14
Rusco, f.o.b. Nitro	lb.	.12 @	.30
Sericite, f.o.b. N. Y.	ton	65.00 @	—
Soap Tree Bark, sifted	lb.	.06 @	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.19 @	—
Black	lb.	.07 @	.11
White	lb.	.08 @	.12
Brown	lb.	.07 @	.11
Neophax	lb.	.10¼ @	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.07½ @	.15
Sulfur Chloride, yellow (drs.)	lb.	.04 @	—
Sulfur flour, Refined, 100% pure (bags)	cwt.	2.50 @	3.65
Commercial (bags)	cwt.	1.60 @	2.35
Telloy	lb.	2.00 @	—
Vandex	lb.	2.00 @	—

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Total Declared Value	Average Declared Value per pound Cents	Re-exports: Long Tons	Total Declared Value	Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,362	185,060,304	26.71	8,772	5,672,319	28.87	300,590
1924	325,899	173,367,272	23.75	10,309	6,057,637	26.23	315,590
1925	393,370	426,167,504	48.36	14,827	19,847,753	59.76	378,543
1926	409,944	501,131,064	54.57	17,671	22,470,583	56.77	392,273
1927	424,733	338,688,492	35.60	27,775	24,735,488	39.76	396,958
1928	432,633	242,727,423	25.05	32,159	18,128,761	25.17	400,474
1929	560,082	239,177,811	19.06	36,485	16,868,718	20.64	523,597
1930	482,083	139,133,048	12.88	30,205	9,310,205	13.76	451,878
1931	497,176	72,922,845	6.55	25,595	4,255,572	7.42	471,581
1932	409,556	31,936,459	3.48	20,930	2,015,612	4.30	388,626
1933	407,817	44,034,064	4.82	20,537	2,601,352	5.65	387,280
1934	449,513	97,929,676	9.73	23,848	5,770,109	10.80	425,665
1935	453,134	115,299,448	11.36	11,389	3,084,331	12.09	441,745
1936	467,064	152,072,496	14.54	12,581	4,488,223	15.93	454,483
1937	574,600	237,307,041	18.44	7,902	3,385,433	19.02	566,698
1937:							
Oct.	51,171	20,250,893	17.67	450	172,466	17.13	50,721
Nov.	51,958	19,905,523	17.01	159	66,501	18.72	51,799
Dec.	68,006	24,934,206	16.37	290	91,764	14.14	67,716
1938:							
Jan.	43,984	15,115,732	15.34	325	118,514	16.27	43,659
Feb.	39,380	13,095,429	14.85	305	109,756	16.08	39,075
Mar.	41,592	13,494,654	14.48	646	198,865	13.74	40,946
Apr.	31,042	9,495,476	13.66	250	75,797	13.55	30,792
May	27,229	8,010,250	13.13	528	167,831	14.20	26,701
June	25,983	7,150,115	12.29	399	116,458	13.03	25,584
July	21,771	5,723,381	11.74	420	127,522	13.54	21,351
Aug.	30,798	8,477,231	12.29	432	133,350	13.79	30,366
Sept.	34,383	10,650,107	13.83	803	242,324	13.48	33,580
Oct.	33,449	10,945,896	14.61	621	196,523	14.14	32,828
Nov.	31,903	10,572,345	14.79	415	146,276	15.73	31,488

* Revised.

Note: "Gross Imports" do not include latex or guayule. To secure more accurate figures for "Net Imports" latex and guayule figures (shown below) should be added and the re-export figure deducted from the total. Annual figures for 1922, however, include both latex and guayule; guayule only is included in 1923. Annual figures for 1922-36 were revised in February, 1937.

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Liquid Latex (1) Tons	Liquid Latex (1) Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,272	3,537,510
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,394	4,686,743
1927	5,018	2,674,957	582	477,246	7,785	2,448,657	1,495	1,170,650
1928	3,077	1,755,685	731	430,855	7,552	2,540,059	4,007	2,121,786
1929	1,275	545,175	728	566,964	8,204	2,458,126	3,729	1,788,391
1930	1,096	347,388	502	422,684	5,907	1,403,244	4,458	1,508,786
1931	....	.....	1,207	411,380	5,777	1,019,010	4,675	888,909
1932	....	.....	707	147,403	4,607	616,596	5,112	601,999
1933	....	.....	1,659	2,261,869	5,990	944,895	11,085	1,833,671
1934	398	75,349	1,054	438,209	4,987	943,752	13,107	3,643,221
1935	459	86,835	615	188,384	5,644	1,063,126	13,553	3,782,222
1936	1,229	286,552	535	199,368	6,163	1,296,364	19,852	6,659,899
1937	2,694	745,873	354	151,344	7,109	2,017,786	23,185	10,213,670
1937:								
Oct.	247	68,178	29	12,090	460	149,516	1,958	844,205
Nov.	251	69,452	29	9,374	593	194,889	2,085	875,074
Dec.	140	34,347	31	11,491	1,325	470,553	1,804	694,164
1938:								
Jan.	538	147,685	23	8,958	598	224,443	1,400	494,242
Feb.	218	60,097	33	11,393	892	355,080	1,684	560,883
Mar.	150	41,518	69	19,454	587	239,271	979	327,844
Apr.	188	50,423	66	25,741	1,265	444,756	889	295,690
May	229	61,756	29	8,806	900	274,652	879	279,502
June	150	41,518	34	11,496	918	276,126	695	214,420
July	223	49,099	51	16,130	869	267,491	634	209,526
Aug.	250	53,285	41	13,637	526	159,784	876	308,573
Sept.	173	37,954	39	13,896	740	225,161	683	235,242
Oct.	126	27,692	45	20,641	614	163,635	876	347,348
Nov.	59	12,923	66	24,725	307	76,452	1,020	394,082

(1) Weight given in pounds of dry rubber contained in latex.

Note: Annual figures for 1924-1936 revised on basis of information received on February 8, 1937.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

	Figures on Monthly Basis: 1931*	1932*	1933*	1934*	1935*	1936*	1937*	1938
Jan.	28,640	29,648	22,645	39,190	46,636	48,631	50,879	29,429
Feb.	28,880	31,821	21,392	40,515	42,720	36,841	51,950	23,868
Mar.	32,883	29,505	17,843	47,003	42,153	42,813	54,129	30,487
Apr.	33,418	27,518	25,928	44,853	44,247	52,031	51,859	27,984
May	37,927	30,957	44,074	42,918	41,101	50,612	51,795	28,947
June	38,027	41,475	50,743	40,147	36,156	52,772	51,860	30,629
July	32,030	29,976	49,614	32,553	35,917	48,250	43,703	32,209
Aug.	27,666	23,721	44,428	33,216	38,775	46,777	41,506	38,170
Sept.	23,707	23,847	35,281	30,258	37,086	46,449	43,945	37,823
Oct.	22,342	22,286	31,543	31,253	41,969	49,637	38,754	40,333
Nov.	23,010	23,231	28,831	34,748	42,310	50,433	34,025	46,048
Dec.	21,470	18,015	28,757	36,569	42,474	49,754	29,195	.....
Tot.	350,000	332,000	401,079	453,223	491,544	575,000	543,600	.....

* Revised.

Note: Figures for 1931-1937 were revised in May, 1938, and are now based on Department of Commerce survey figures.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*	Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*
1928	208,516	223,000	50.4	24,785	1933	99,560	81,602	19.9	20,746
1929	218,954	226,588	48.4	27,464	1934	110,010	100,597	22.2	23,079
1930	157,967	153,497	40.8	22,000	1935	122,948	113,078*	23.0*	25,069
1931	133,351	124,126	33.9	19,257	1936	150,571	141,486*	24.6*	19,008*
1932	75,608	77,504	23.4	16,354	1937	178,776	157,990	29.1	26,260

Figures on Monthly Basis	Production	Consumption: Tons	Consumption: % to Crude	Stocks*		Production	Consumption: Tons	Consumption: % to Crude	Stocks*
1937:									
Jan.*	15,129	14,450	28.4	18,822	July	16,241*	12,128*	27.8*	17,682*
Feb.*	15,192	14,578	28.1	18,490	Aug.	16,543*	13,227*	31.9*	19,706*
Mar.*	14,462	15,601	28.9	16,450	Sept.	16,410	13,681	37.4	21,597
Apr.	13,884	15,607	30.1	14,046	Oct.	15,849	12,234	31.6	23,572
May	15,793	14,693	28.4	14,647	Nov.	12,406	9,703	28.6	24,620
June	16,052	14,414	27.8	14,535	Dec.	10,815	7,674	26.3	26,260
1938:									
Jan.	8,467	6,673	22.7	27,179	July	7,109	8,273	25.7	18,832
Feb.	6,012	6,867	28.8	26,431	Aug.	10,472	10,732	28.1	17,892
Mar.	6,669	8,573	27.1	24,401	Sept.	12,016	11,281	29.8	18,127
Apr.	6,399	7,480	26.7	23,339	Oct.	13,558	11,803	29.3	19,090
May	6,866	8,009	27.7	22,275	Nov.	13,995	12,668	27.5	19,823
June	7,584	8,274	27.0	21,040	Dec.	.....	.....	...	.....

* Stocks on hand at the end of month or year.

* Revised.

Note: Figures for 1936 were revised on June 1, 1937, and are now based on Department of Commerce survey figures.

U. S. Consumption of Gasoline

(Bureau of Mines Statistics)

(In Thousands of Barrels of 42 Gallons)

	1936*	1937*	1938		1936*	1937*	1938
January	32,344	33,668	35,176	August	46,061	49,598	50,459
February	27,178	32,034	31,861	September	44,366	47,515	46,058
March	35,864	40,524	41,259	October	44,163	45,446	46,272
April	38,864	43,461	43,254	November	39,954	42,718	44,991
May	42,010	45,407	44,911	December	39,590	39,465	.....
June	44,522	48,447	48,293				
July	46,865	51,069	47,474	Total	481,606	519,352	.....

* Revised.

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total		Total		Total
1926	24,199,524	1930	17,364,096	1934	12,255,118
1927	19,700,003	1931	11,253,800	1935	18,664,356
1928	24,247,282	1932	6,261,336	1936	20,790,192
1929	24,141,507	1933	8,713,962	1937	22,257,964

1938		1938		1938	
January ...	527,899	May	706,188	September .	819,089
February ..	477,600	June	527,121	October ...	1,312,094
March	854,031	July	406,419	November ..	1,722,769
April	970,545	August	467,506	December ..	.....

ADVERTISING PAGES REMOVED

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1936																																
Oct.	16⅞	16⅞	16½		16½	16⅝	16⅝	16⅝	16½				16½	16½	16½	16⅝	16⅞		16⅞	16⅞	16⅞											
Nov.		17⅛		17½		17⅞			17½	17⅜		17⅝	17¾	17⅞				18⅛	18¼	18¼	18⅜											
Dec.	18½	18⅝	18⅝	19	19⅛		19⅞	19⅞	19⅛	19⅝	19	19		19¼	19⅛	19⅛		20⅜	20⅛	20⅛	20⅛											
1937																																
Jan.				20⅜	20⅜	21⅛	21⅛	21⅛	22⅛		22⅜	22⅛		21½	21⅛	21⅛	21⅞	21⅞	21⅞	20⅛	20⅛	21⅛	20⅝	20⅝	21⅜	21⅜	21⅜	21⅛	21⅛	21⅛		21⅜
Feb.	21	21	21⅜	21¼	21¾	21⅞	21½	21½	21¾	21¾	23⅜	23⅜	23⅜	23½	23⅜	23⅜	24⅛	25⅛	25⅛	24¾	24¾	23⅝	24¾	24¾	25⅛	25⅝	26¼	26⅛	26⅝	26⅝		21⅜
Mar.	21⅛	21⅛	21⅛	21⅛	23¼	23⅝	24⅛	24⅜	24⅜	24⅛	23⅞	23⅞	23⅞	22½	22⅜	22⅜	22⅜	20⅛	22⅝	22⅝	22⅝	23⅛	23⅛	23⅛	23⅛	22⅝	22¼	20⅛	20⅝	20⅝		23⅝
April	26⅜	26⅜	26⅜	26⅜	23¼	24⅛	24⅜	24⅜	24⅜	24⅛	23⅞	23⅞	23⅞	22½	22⅜	22⅜	22⅜	20⅛	22⅝	22⅝	22⅝	23⅛	23⅛	23⅛	23⅛	22⅝	22¼	20⅛	20⅝	20⅝		23⅝
May	21	21	21	21⅛	21⅛	21⅛	21⅛	22½	21⅛	21½	21⅝	21⅝	21⅝	20⅞	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	19⅞	19⅞	19⅞	19⅞	19⅞		21⅛
June	20⅛	20⅛	19⅞	19⅛	19⅛	19⅛	19⅛	19⅛	18½	19⅛	19⅛	19⅛	19	18⅞	18⅞	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	18⅞	18⅞	18⅞	18⅞		19⅛
July	19⅛	19⅛	18⅞	18½	18⅛	18⅛	19⅛	19⅛	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞		18⅞
Aug.	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛		18⅛
Sept.	18⅜	18⅜	18⅜	17⅝	17⅝	17⅝	18⅞	19⅛	19⅛	19⅛	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞	18⅞		18⅞
Oct.	17¾	17¾	17¾	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½	17½		17½
Nov.	15⅞	15⅞	15⅞	15½	15½	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝		15⅝
Dec.	15	15⅛	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞	14⅞		14⅞
1938																																
Jan.		14⅞	14⅞	14⅞	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
Feb.	14⅞	14⅞	14⅞	14⅞	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
Mar.	14⅞	14⅞	14⅞	14⅞	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
April	14⅞	14⅞	14⅞	14⅞	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
May	14⅞	14⅞	14⅞	14⅞	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
June	14⅞	14⅞	14⅞	14⅞	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
July	14⅞	14⅞	14⅞	14⅞	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜
August	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜	15⅜
Sept.	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛	15⅛
Oct.	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛
Nov.	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛
Dec.	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛	16⅛
1939																																
Jan.																																

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1911-1930

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	**37.72**
1912	121.60	1916	72.50	1920	36.30	1924	26.20	1928	**22.48**
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	**20.55**
1914	65.33	1918	60.15	1922	17.30	1926	48.50	1930	**11.98**

Average Monthly Price per Pound Since 1930

	1931 Cents	1932 Cents	1933 Cents	1934 Cents	1935 Cents	1936 Cents	1937 Cents	1938 Cents
Jan.	8.34	4.38	3.08	9.32	13.10	14.35	21.37	**14.63**
Feb.	7.70	4.03	2.95	10.45	12.92	15.48	21.33	**14.71**
Mar.	7.71	3.35	3.01	11.01	11.51	15.89	24.09	**13.55**
Apr.	6.43	3.02	3.56	12.10	11.55	15.98	23.44	**11.84**
May	6.49	3.09	4.95	13.26	12.05	15.62	21.14	11.57
June	6.35	2.66	6.15	13.51	12.57	15.85	19.29	12.57
July	6.37	2.89	8.01	14.60	12.10	16.49	18.86	15.37
Aug.	5.38	3.63	7.31	15.47	11.98	16.25	18.37	16.08
Sept.	5.08	3.84	7.30	15.36	11.55	16.46	18.55	16.15
Oct.	4.87	3.65	7.64	13.96	12.62	16.55	16.28	16.89
Nov.	4.65	3.44	8.66	13.04	13.15	17.97	14.60	16.24
Dec.	4.64	3.24	8.87	12.98	13.28	20.01	15.41	16.05
Average for Year	6.17	3.49	5.96	12.92	12.37	16.41	19.39	14.64

London Closing Prices of Ribbed Smoked Sheets

(In Pence Per Pound)

Day	1938 Oct.	1938 Nov.	1938 Dec.	1939 Jan.	Day	1938 Oct.	1938 Nov.	1938 Dec.	1939 Jan.
1		8¼	8		17	8½	7	8	
2		8¼	7		18	8	7		
3	8	8	7	8	19	8	7	8	
4	8	8		8	20	8		8	
5	8¼	8	7	8	21	8	7	8	
6	8		7	8	22	8	7	8	
7	8	8	7	8	23		7	8	
8	8	8	7		24	8	7		
9		8	7	8	25	8	8		
10	8	8	7	8	26	8	8		
11	8	8			27	8			
12	8	8	8		28	8	7	8	
13	8		7		29	8	7	8	
14	8½	8	8		30		7	8	
15	8½	8	8		31	8			
16		8	8						

Average Monthly Price Per Pound

Month	1935 Pence	1936 Pence	1937 Pence	1938 Pence	Month	1935 Pence	1936 Pence	1937 Pence	1938 Pence
Jan.	6.434	6.758	10.378	7.077	Aug.	5.696	7.581	8.830	7.841
Feb.	6.292	7.255	10.503	7.029	Sept.	5.508	7.577	8.935	7.918
Mar.	5.745	7.450	11.766	6.590	Oct.	6.130	7.898	7.855	8.355
Apr.	5.604	7.502	11.471	5.793	Nov.	6.308	8.572	7.080	8.111
May	5.822	7.335	10.250	5.632	Dec.	6.340	9.580	7.332	8.005
June	6.027	7.352	9.548	6.147	Average for Year	5.976	7.713	9.424	7.164
July	5.801	7.696	9.136	7.464					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	1938 Nov.	1938 Dec.	1939 Jan.	Date	1938 Nov.	1938 Dec.	1939 Jan.	Date	1938 Nov.	1938 Dec.	1939 Jan.
1	9.01	8.95		11				22	9.11	8.85	
2	9.01	8.75		12	9.27	8.66		23	9.06	8.82	
3	8.94	8.59	8.94	13		8.58		24			
4	8.87		8.92	14	9.36	8.65		25	9.08		
5	8.88	8.60	8.91	15	9.28	8.68		26	9.04		
6		8.69	8.85	16	9.27	8.62		27		8.78	
7	8.94	8.72	8.91	17	9.34	8.66		28	8.96	8.91	
8		8.66		18	9.30			29	8.98	8.85	
9	9.66	8.57	8.86	19	8.97	8.72		30	8.96	8.83	
10	9.18	8.68	8.78	20		8.76		31			
				21	9.08	8.79					

Average Monthly Price Per Pound

	1935 Cents	1936 Cents	1937 Cents	1938 Cents		1935 Cents	1936 Cents	1937 Cents	1938 Cents
Jan.	12.70	11.91	13.06	**8.57**	Aug.	11.48	12.28	10.41	**8.41**
Feb.	12.58	11.53	13.15	**8.91**	Sept.	10.80	12.31	9.02	**8.17**
Mar.	11.63	11.43	14.46	**8.92**	Oct.	11.28	12.30	8.42	**8.61**
Apr.	11.73	11.71	14.23	**8.76**	Nov.	12.01	12.23	7.96	**9.08**
May	12.25	11.68	13.34	**8.50**	Dec.	11.99	12.83	8.26	**8.72**
June	11.89	12.02	12.70	**8.38**	Average for Year	11.88	12.11	11.44	**8.66**
July	12.26	13.11	12.26	**8.85**					

Stocks of Crude Rubber

(All figures are in long tons)

ON HAND OR AFLOAT TO THE U. S.

End of	ON HAND 1936	ON HAND 1937	ON HAND 1938	AFLOAT 1936	AFLOAT 1937	AFLOAT 1938	ON HAND AND AFLOAT 1936	ON HAND AND AFLOAT 1937	ON HAND AND AFLOAT 1938
Jan.	296,683	204,436	274,581	43,870	55,096	57,356	340,553	259,532	331,937
Feb.	293,631	195,692	294,338	46,532	53,538	47,459	340,163	249,230	341,797
Mar.	284,561	192,980	299,172	58,935	56,994	41,882	343,496	249,974	341,054
Apr.	277,478	176,289	301,436	47,678	72,530	39,071	315,156	248,819	340,507
May	262,415	175,273	299,720	48,860	58,542	32,859	311,275	233,815	332,579
June	245,544	172,056	294,566	47,228	57,215	32,079	292,872	229,271	326,645
July	235,850	167,094	284,914	60,343	75,779	40,400	296,193	242,873	325,314
Aug.	230,167	174,195	277,463	63,597	80,439	47,772	293,764	254,634	325,235
Sept.	233,336	186,193	276,586	62,240	83,288	48,927	295,576	269,481	325,513
Oct.	224,000	200,025	269,937	67,825	80,653	51,062	291,825	280,678	320,999
Nov.	211,480	222,707	254,318	73,691	81,302		285,171	304,009	305,432
Dec.	223,000	262,204		56,567	63,099		279,567	325,303	

* Revised.

STOCKS IN GREAT BRITAIN

(No. of Tons in Wharves and Warehouses, not including Latex)

At end of	London 1936	London 1937	London 1938	Liverpool 1936	Liverpool 1937	Liverpool 1938
January	84,791	29,005	40,203	77,188	41,895	21,711
February	79,757	26,508	46,596	77,138	37,078	24,737
March	74,779	21,292	50,233	72,823	30,622	26,220
April	68,932	21,128	54,296	71,388	27,443	28,277
May	61,349	21,351	57,194	69,150	25,081	29,862
June	55,993	21,964	60,307	66,173	21,258	31,837
July	49,575	22,589	62,236	63,715	19,424	32,825
August	45,749	25,211	65,113	62,367	19,817	34,315
September	44,364	28,462	63,321	59,485	21,190	34,645
October	40,777	30,465	59,609	55,738	21,327	33,483
November	37,495	33,304	57,794	51,184	21,399	32,116
December	33,027	35,633		45,291	21,978	

(Figures from the Rubber Trade Association of London)

STOCKS IN OTHER CENTRES

(Figures from Statistical Bulletin of the Int'l Rubber Regulation Committee)

	Penang and Singapore [1]	Malaya [2]	Ceylon [2]	Holland	Para and Manaos
At end of 1937					
December	44,792*	45,734	5,632	100	1,771*
At end of 1938					
January	48,494*	49,643	5,976	131	2,024
February	46,241	47,990	5,653	169	2,342
March	50,797	48,473	5,490	180	1,212
April	40,614	45,008	4,812	155	1,083
May	40,598	45,426	4,876	169	816
June	44,729	49,290	4,488	190	904*
July	45,529	52,081	5,014	711	944
August	41,002	49,922	4,659	672	1,032
September	35,386	53,815	5,339	662	1,599
October	34,901		4,916	669	1,402

[1] Dealers' and Port Stocks. [2] Inside Regulated Areas. [3] Dealers' Stocks Only.
* Revised.

RUBBER STOCKS AFLOAT

	Afloat for United States	Afloat for Europe	All Other * Afloat	Total * Afloat
End of: 1937				
September	83,288	37,400	20,312	141,000
October	80,653	35,000	19,347	135,000
November	81,302	39,100	6,598	127,000
December	63,099	45,100	26,801	135,000
End of: 1938				
January	57,356	40,500	15,144	113,000
February	47,459	44,200	16,341	108,000
March	41,882	44,700	22,418	109,000
April	39,071	42,960	31,969	114,000
May	32,859	40,600	20,541	94,000
June	32,079	42,580	17,341	92,000
July	40,400	39,150	25,450	105,000
August	47,772	34,500	18,728	101,000
September	48,927	30,000	17,073	96,000
October	51,062	30,000	17,938	99,000
November	51,114	27,000	14,886	93,000

* *Total Afloat* is an arbitrary estimate based on 1½ months' shipments as adopted by the Department of Commerce. *All Other Afloat* is determined by subtracting the amount of stocks in transit to the United States and Europe from the estimated total.
P—Preliminary estimate.

TOTAL PRINCIPAL WORLD STOCKS

(Figures from the Survey of Current Business)

At end of	1933	1934	1935	1936*	1937	1938
January	634,797	661,948	698,153	600,479	454,249*	551,632*
February	626,227	663,308	686,195	599,355	445,265*	569,242*
March	638,428	666,382	678,809	583,318	447,856*	591,968
April	629,159	658,796	677,006	567,172	428,249*	593,340
May	626,537	689,230	677,569	541,871	413,134*	577,063*
June	613,055	672,804	671,525	520,255	434,250*	583,952
July	618,258	676,200	679,061	519,074	445,782	593,481
August	617,449	674,702	680,644	500,520	457,462*	580,489*
September	623,683	694,361	661,509	493,585	470,768*	568,902*
October	636,597	680,616	655,000	486,159	479,398*	560,948
November	642,968	684,408	617,300*	466,491	493,266*	533,638
December	634,890	705,975	613,987*	466,576	545,533*	
Monthly Avge.	630,171	677,395	666,397*	528,738	460,022*	

* Revised.

U. S. Tire and Tube Statistics[1]

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Production Figures on Quarterly Basis								
Quarter	1931	1932	1933	1934	1935	1936	1937	1938
Jan.-Mar.	12,323	11,004	6,635	13,437	13,355	11,798	16,142	7,714
Apr.-June	16,295	12,980	14,412	13,565	12,597	15,443	16,421	8,570
July-Sept.	12,004	9,245	14,707	9,822	11,312	15,467	12,659	11,416
Oct.-Dec.	8,117	6,856	9,550	10,406	12,099	15,409	10,063	
Total	48,739	40,085	45,304	47,230	49,363	58,117	55,285	

Shipment Figures on Quarterly Basis								
Quarter	1931	1932	1933	1934	1935	1936	1937	1938
Jan.-Mar.	11,268	8,760	6,981	10,730	11,154	10,944	14,667	7,716
Apr.-June	15,919	18,021	15,139	14,998	13,473	16,530	16,324	10,745
July-Sept.	14,354	8,141	13,707	11,648	13,489	14,558	13,591	11,936
Oct.-Dec.	8,510	5,329	8,265	9,310	12,066	13,331	10,864	
Total	50,051	40,251	44,092	46,686	50,182	55,363	55,446	

Inventory Figures [2]								
Quarter	1931	1932	1933	1934	1935	1936	1937	1938
Jan.-Mar	10,014	9,878	7,290	11,651	11,675	9,087	12,488	10,808
Apr.-June	10,447	4,999	6,615	10,219	10,755	7,835	12,529	8,763
July-Sept.	8,158	6,096	7,595	8,419	8,288	9,012	11,615	8,406
Oct.-Dec.	7,775	7,644	8,888	9,455	8,196	11,114	10,767	

Figures for Recent Months

	PRODUCTION 1936	PRODUCTION 1937	PRODUCTION 1938	SHIPMENTS 1936	SHIPMENTS 1937	SHIPMENTS 1938	INVENTORY [2] 1936	INVENTORY [2] 1937	INVENTORY [2] 1938
Oct.	5,126	3,985	4,134	4,082	3,951	4,144	10,096	11,644	8,237
Nov.	4,972	3,120	4,117	4,233	3,777	4,442	10,823	10,963	7,924
Dec.	5,311	2,959		5,016	3,156		11,114	10,768	

AUTOMOBILE INNER TUBES

Production Figures on Quarterly Basis								
Quarter	1931	1932	1933	1934	1935	1936	1937	1938
Jan.-Mar.	11,989	10,721	6,230	12,823	12,553	11,935	15,714	6,938
Apr.-June	15,388	11,913	13,001	13,191	11,631	14,678	15,299	7,177
July-Sept.	12,839	8,286	14,356	10,321	11,270	15,377	11,949	10,462
Oct.-Dec.	8,117	5,970	9,000	9,891	12,425	15,257	9,024	
Total	48,333	36,890	42,587	46,226	47,879	57,247	51,986	

Shipment Figures on Quarterly Basis								
Quarter	1931	1932	1933	1934	1935	1936	1937	1938
Jan.-Mar.	11,251	8,918	6,539	10,640	11,252	11,410	14,498	6,969
Apr.-June	15,314	16,271	13,292	14,553	11,928	15,169	15,381	9,301
July-Sept.	15,282	7,761	13,370	11,545	13,251	15,125	12,805	10,541
Oct.-Dec.	8,174	4,961	8,189	8,306	11,636	12,921	9,693	
Total	50,021	37,911	41,390	45,044	48,067	54,625	52,377	

Inventory Figures [2]								
Quarter	1931	1932	1933	1934	1935	1936	1937	1938
Jan.-Mar.	10,475	9,448	6,369	10,244	10,406	8,692	11,904	10,093
Apr.-June	10,504	5,174	6,097	8,795	10,050	8,105	11,746	8,108
July-Sept.	8,095	5,753	7,008	7,639	7,565	8,627	11,242	7,907
Oct.-Dec.	7,922	6,749	7,815	9,180	8,231	10,985	10,235	

Figures for Recent Months

	PRODUCTION 1936	PRODUCTION 1937	PRODUCTION 1938	SHIPMENTS 1936	SHIPMENTS 1937	SHIPMENTS 1938	INVENTORY [2] 1936	INVENTORY [2] 1937	INVENTORY [2] 1938
Oct.	5,397	3,772	3,924	4,108	3,499	4,125	9,977	11,103	7,737
Nov.	4,739	2,870	3,944	3,995	3,334	4,122	10,732	10,527	7,587
Dec.	5,121	2,382		4,819	2,859		10,985	10,236	

[1] Based on reports received from the Rubber Manufacturers Association.
[2] Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	United States Passenger Cars	United States Trucks	Canada Total	Canada Passenger Cars	Canada Trucks	Grand Total
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933*	1,920,057	1,573,512	346,545	65,924	53,855	12,069	1,992,126
1934*	2,753,111	2,177,919	575,192	116,852	92,647	24,205	2,869,963
1935*	3,946,934	3,252,244	694,690	172,877	135,562	37,315	4,119,811
1936*	4,454,115	3,669,528	784,587	162,159	128,369	33,790	4,616,274
1937*	4,808,974	3,915,889	893,085	207,463	153,046	54,417	5,016,437
1938							
Apr.	219,314	176,078	43,236	18,819	14,033	4,786	238,133
May	192,068	154,958	37,110	18,115	13,641	4,474	210,183
June	174,667	136,531	38,136	14,732	11,014	3,718	189,399
July	141,437	106,841	34,596	9,007	5,273	3,734	150,444
Aug.	90,484	58,624	31,860	6,452	3,063	3,389	96,936
Sept.	83,534	65,159	18,375	6,089	4,290	1,799	89,623
Oct.	209,522	187,494	22,028	5,774	5,412	362	215,296
Nov.	372,358	320,344	52,014	17,992	15,423	2,569	390,350
Dec.	.....	.....	.....	.....	.....	.....	.....

* Revised.
Note: U. S. figures represent factory sales; Canadian figures represent production.

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA [1]								NETHERLAND INDIES [4]						
	Gross Exports	Imports	Net Exports	Ceylon [2]	India & Burma [3]	Sarawak [3]	British North Borneo [3]	Siam [3]	Java & Madura	Sumatra E. Coast	Other N. I.	Indo-China [3]	Amazon Valley	All Other [5]	World Total [6]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	37,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,300
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,381	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	374,836	163,092	211,744	81,584	11,063	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,294	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1933	573,412	167,377	406,035	63,351	4,527	10,874	7,555	7,765	73,851	91,861	149,659	18,394	9,883	2,737	846,312
1934	677,361	211,803	465,558	79,746	10,492	17,233	11,103	17,545	87,400	112,058	175,470	20,170	8,903	2,985	1,008,663
1935	590,319	174,652	415,667	54,316	13,968	19,465	8,885	28,327	57,488	78,325	139,297	28,816	11,275	8,745	864,574
1936	520,286	167,799	352,487	49 692	14,724	21,243	8,177	33,702	61,307	84,577	152,205	40,782	14,193	11,466	845,431
1937	681,638	213,446	468,192	70,353	17,015	25,922	13,213	30,462	19,164	14,970	4,343	4,680	2,400	13,063	1,055,356
1937:															
July	71,863	26,100	45,763	6,279	966	2,543	1,414	3,175	7,512	11,557	23,520	5,563	854	1,416	110,562
Aug.	64,525	21,395	43,130	7,308	605	1,624	1,189	2,999	6,785	11,563	21,014	2,277	1,248	1,283	101,025
Sept.	67,414	19,065	48,349	5,804	1,092	2,659	969	3,173	6,402	10,862	19,611	4,131	1,007	1,145	105,204
Oct.	59,319	11,858	47,461	6,701	1,248	523	1,505	2,352	6,587	12,172	14,188	3,753	1,434	1,147	99,071
Nov.	57,850	12,396	45,454	4,391	2,135	2,517	1,327	2,549	6,310	10,003	11,596	4,556	963	1,037	92,838
Dec.	56,791	13,949	42,842	9,529	2,708	3,009	1,172	2,957	9,108	12,272	11,731	5,384	2,011	1,032	103,755
1938:															
Jan.	47,986	17,078	30,908	5,222	1,379	3,485	1,307	2,897	4,476	9,283	12,708	6,088	878	1,538	80,169
Feb.	48,899	11,874	37,025	5,216	1,409	8	918	3,266	6,391	8,777	12,154	3,070	1,542	1,032	80,808
Mar.	49,197	15,813	33,384	3,834	1,235	1,564	853	2,837	5,673	10,156	15,447	3,213	1,831	1,322	81,349
Apr.	53,864	9,158	44,706	1,951	1,327	1,728	1,158	1,583	5,967	10,081	12,434	3,647	1,004	774	86,360
May	38,245	10,325	27,920	2,833	1,470	1,648	815	2,507	4,575	7,515	9,944	3,118	1,053	904	64,302
June	42,258	14,394	27,864	3,693	1,318	2,441	643	3,904	4,519	7,788	12,120	4,776	718	818	70,602
July	43,689	18,713	24,976	3,861	1,083	2,057	937	4,710	6,808	8,271	19,955	5,139	625	1,063	79,485
Aug.	47,246	13,735	33,511	4,401	953	965	728	4,793	4,757	7,339	11,006	3,840	1,050	1,074	74,417
Sept.	40,992	10,586	30,406	3,990	1,036	756	284	3,893	4,026	7,052	9,038	8,139	750*	1,292	70,662
Oct.	42,294	16,599	25,695	4,893	1,111	1,612	1,075	4,438	4,486	8,229	17,088	3,638	1,575*	1,200*	75,040
Nov.	39,340	10,219	29,121	6,437	1,283	929	567	3,223	3,975	5,678	9,472	4,129	1,000*	1,200*	67,014
Dec.	32,901	7,607	25,294												

All figures from January, 1934, onward are net exports shown on a "dry rubber" basis as calculated by the International Rubber Regulation Committee. (1) Prior to January, 1934, Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex also is not included in the early years, which on a dry rubber basis was as follows: 1924—1,117 tons; 1925—3,618; 1926—3,263; 1927—2,439; 1928—2,247; 1929—3,574; 1930—2,750; 1931—1,940; 1932—5,193; 1933—10,470, and 1934—14,172 tons. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments on a dry rubber basis were: 1923—18 tons; 1924—90; 1925—6; 1926—20; 1927—½; 1928—1; 1929—2; 1930—11; 1931—2; 1932—2; 1933—1, and 1934—6 tons. (3) Official statistics. (4) Exports from "Other N. I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included in earlier years, which is as follows on a dry rubber basis: 1923—2,342 tons; 1924—1,008; 1925—2,239; 1926—44; 1927—84; 1928—1,395; 1929—437; 1930—2,744; 1931—3,874; 1932—3,488; 1933—5,260, and 1934—5,330 tons. (5) Calculated from official import statistics of principal consuming countries; also includes United States imports of guayule. (6) This total includes the third column for British Malaya and all other figures shown for other territories. (*) Figure is provisional.

NOTE: ANNUAL FIGURES ARE MORE ACCURATE; THEY ARE REVISED AT THE END OF THE FOLLOWING YEAR.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States [1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,883	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1933	398,365	73,335	61,953	54,120	19,332	66,831	19,341	29,830	13,534	11,166	1,243	7,831	5,520	10,402	772,803
1934	439,172	158,482	49,560	59,330	28,439	69,905	21,398	47,271	9,642	9,115	3,758	12,418	6,900	10,999	926,389
1935	455,758	128,829	51,450	62,899	26,870	57,567	21,880	37,572	9,978	7,593	4,068	11,878	8,140	11,245	895,727
1936	475,359	—2,591	57,032	71,794	27,871	61,223	16,534	30,967	14,109	9,648	2,888	11,236	6,668	8,772	791,510
1937	592,394	92,707	59,871	98,170	36,088	62,311	24,733	30,462	19,164	14,970	4,343	4,680	2,400	13,063	1,055,356
1937:															
July	43,018	10,628	4,306	7,860	1,946	4,851	2,719	2,150	1,902	851	497	1,409	200*	753	83,090
Aug.	49,485	15,757	4,488	8,752	3,506	4,409	2,569	1,226	2,153	1,013	382	1,386	200*	1,692	97,018
Sept.	56,685	15,671	4,820	10,595	2,396	3,666	1,941	1,391	3,184	1,258	337	1,648	200*	1,369	105,161
Oct.	52,926	11,899	4,278	8,076	5,998	2,059	951	3,726	2,470	967	367	1,535	200*	988	96,440
Nov.	54,135	12,878	4,311	8,848	4,787	1,368	2,857	3,725	1,935	925	313	970	200*	846	98,098
Dec.	69,660	10,655	5,736	9,580	2,619	1,995	1,976	1,607	767	1,286	318	1,008	200*	1,890	109,297
1938:															
Jan.	45,596	15,458	4,769	6,314	1,789	4,935	1,857	2,693	574	1,257	300	1,239	200*	1,102	86,083
Feb.	40,977	16,505	5,456	6,959	615	3,173	2,053	2,341	578	974	534	1,114	200*	1,771	82,843
Mar.	42,075	15,911	4,845	10,768	2,123	6,222	1,365	2,162	1,043	961	342	1,088	200*	1,324	90,429
Apr.	31,870	14,653	5,757	6,497	999	5,456	2,397	4,281	640	904	449	971	200*	920	75,994
May	27,809	14,675	5,169	9,595	2,545	3,328	2,422	4,163	1,041	1,137	419	1,283	200*	957	74,743
June	26,429	14,053	4,542	7,460	3,243	2,145	2,399	505	805	853	663	1,149	200*	988	65,434
July	22,209	12,678	5,433	6,927	2,685	3,100	3,641	541	1,215	1,106	526	1,151	200*	635	62,047
Aug.	31,494	12,891	3,662	7,190	1,832	2,034	2,045	739	1,182	1,238	259	965	200*	595	66,326
Sept.	34,436	8,100	5,094	7,390	1,405	3,586	1,832	1,725	1,779	514	385	1,830	200*	608	68,884
Oct.	33,830	3,085	3,791	6,326	3,139	3,204	3,921	2,000*	1,780	848	420	3,022	200*	600	66,202
Nov.	32,567	936	5,322	7,275					660		530				

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]—United States imports of guayule are included in this compilation. *—Figure is provisional; final figure will be shown when available.

NOTE: ANNUAL FIGURES ARE MORE ACCURATE: THEY ARE REVISED AT THE END OF THE FOLLOWING YEAR.

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